

OPERATOR'S MANUAL

RADIO SETS AN/TRC-24, AN/GRC-75, AN/GRC-78, AND AN/GRC-81; RADIO TERMINAL SETS AN/TRC-35, AN/GRC-76, AN/GRC-79, AND AN/GRC-82; RADIO RELAY SET AN/TRC-36; RADIO REPEATER SETS AN/GRC-77, AN/GRC-80, AND AN/GRC-83; AND RADIO SET GROUP AN/TRA-25



DEPARTMENTS OF THE ARMY AND THE AIR FORCE

WARNING

HIGH VOLTAGE

is used in the operation
of this equipment.

DEATH ON CONTACT

may result if operating
personnel fail to observe
safety precautions.

DANGEROUS VOLTAGES ARE PRESENT AT THE FOLLOWING LOCATIONS:

Transmitter, Radio T-302(*)/TRC	750 volts direct current
Power Supply PP-685(*)/TRC	900 volts direct current
Transformer, Power, Fixed Auto Transformer TF-167/TRC	115 or 230 volts, 50 to 60 cycles

TECHNICAL MANUAL }
No. 11-5820-287-10 }
TECHNICAL ORDER }
No. 31R2-2TRC24-51 }

DEPARTMENTS OF THE ARMY
AND THE AIR FORCE

WASHINGTON 25, D. C., 19 September 1960

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TERMINAL SETS AN/TRC-35, AN/GRC-76, AN/GRC-79, AND AN/GRC-82;
RADIO RELAY SET AN/TRC-36; RADIO REPEATER SETS AN/GRC-77, AN/GRC-80,
AND AN/GRC-83; AND RADIO SET GROUP AN/TRA-25**

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* This manual supersedes so much of TM 11-687, 14 September 1955, including C1, 23 May 1956, C2, 7 November 1956, C3, 21 February 1957, C4, 13 May 1958, C5, 7 November 1958, C6, 22 July 1959, and C7, 26 May 1960, as pertains to operating instructions and TM 11-5820-287-10P, 15 June 1959.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual describes Radio Sets AN/TRC-24, AN/GRC-75, AN/GRC-78, and AN/GRC-81; Radio Terminal Sets AN/TRC-35, AN/GRC-76, AN/GRC-79, and AN/GRC-82; Radio Relay Set AN/TRC-36, Radio Repeater Sets AN/GRC-77, AN/GRC-80, and AN/GRC-83, and Radio Set Group AN/TRA-25, and covers their operation and operator's maintenance. It includes operation under usual and unusual conditions, cleaning and inspection of the equipment, and replacement of authorized parts for first echelon maintenance personnel.

b. All the radio equipment sets are similar, but differ in the type and quantity of components (par. 5).

- (1) The difference in types of components is primarily related to the frequency band over which a particular set may be operated. The AN/TRC-24, AN/TRC-35, and AN/TRC-36 are equipped for B- and C-band operation; the AN/GRC-75, AN/GRC-76, and AN/GRC-77 for A-band operation; the AN/GRC-78, AN/GRC-79, and AN/GRC-80 for B- and D-band operation; and the AN/GRC-81, AN/GRC-82, and AN/GRC-83 for C-band operation. The AN/TRA-25 may be used with sets which contain B-band facilities to provide operation over the F-band.

- (2) The difference in quantity of components is primarily related to the intended application of a set in a system (par. 3).

c. Official nomenclature followed by (*) is used to indicate all models of the equipment covered in this manual. The following chart indicates the various models that are indicated by a particular nomenclature.

Nomenclature	Models
Transmitter Radio, T-302(*)/TRC.	Transmitter, Radio T-302/ TRC and T-302A/TRC.
Receiver, Radio R-417(*)/TRC.	Receiver, Radio R-417/ TRC and R-417A/TRC.

Nomenclature	Models
Power Supply PP-685(*)/TRC.	Power Supply PP-685/TRC and PP-685A/TRC.
Amplifier-Multiplier, Radio Frequency AM-915(*)/TRC.	Amplifier-Multiplier, Radio Frequency AN-915/TRC and AM-915A/TRC.
Radio Frequency Amplifier AM-912(*)/TRC.	Radio Frequency Amplifier AM-912/TRC and AM-912A/TRC.

2. Forms and Records

a. *Unsatisfactory Equipment Reports.*

- (1) Fill out and forward DD Form 787-1 (Electronics Failure Report—Signal Equipment (*in lieu of* DA Form 468, Unsatisfactory Equipment Report)), to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-MLM, Fort Monmouth, N. J., as prescribed in AR-700-38.
- (2) Fill out and forward AF TO Form 29 (Unsatisfactory Report) to the Commander, Air Materiel Command, Wright-Patterson Air Force Base, Ohio, as prescribed in AF TO 00-35-D54.

b. *Report of Damaged or Improper Shipment.* Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment), as prescribed in AR 700-58 (Army); Navy Shipping Guide, Article 1850-4 (Navy); and AFR 71-4 (Air Force).

c. *Preventive Maintenance Forms.* Prepare DA Form 11-238 (fig. 34 and 35) (Maintenance Check List for Signal Equipment (Sound Equipment, Radio, Direction Finding, Radar, Carrier, Radiosonde and Television)), in accordance with instructions on the form.

d. *Parts List Form.* Forward DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manuals 7, 8, and 9), directly to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-MLM, Fort Monmouth, N. J., with comments on parts listings in appendix II.

e. *Comments on Manual.* Forward all other

comments on this publication directly to the Commanding Officer, U. S. Army Signal Materiel

Support Agency, ATTN: Pub Engrg, Dept. Fort Monmouth, N. J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

a. The radio equipment sets covered in this manual (par. 1) provide the terminal and intermediate point (repeater) facilities for radio sections of multichannel communications systems using carrier equipment such as Telephone Terminals AN/TCC-7 (TM 11-2139-10, TM 11-2150). Other types of carrier telephone terminal equipment may be used if their technical characteristics permit (par. 4).

b. Radio sets, as differentiated from radio terminal sets and radio repeater (or relay) sets (for example, Radio Set AN/TRC-24), may be used at the terminal ends of a radio section, or they may be used in pairs at intermediate points in the section. However, in most cases, *radio sets* are combined with other equipments to form other nomenclature sets which are intended for specific use as terminal sets or as repeater (or relay) sets (par. 5). For example, Radio Terminal Set AN/TRC-35 includes all of the components of one Radio Set AN/TRC-24 plus additional equipment; this set is for use at the terminal ends of a radio section. Radio Relay Set AN/TRC-36 includes most of the components of two Radio Sets AN/TRC-24 plus additional equipment; this set is intended for use at intermediate points to extend the range of the section between terminals.

c. In some cases, most of the major components of one or more *radio sets* is used as a part of a shelter-housed radio terminal or repeater set. For example, Radio Terminal Set AN/MRC-69(V) (TM 11-5820-204-15) includes major components of two *radio sets*; Radio Repeater Set AN/MRC-54(V) (TM 11-5820-203-15) includes major components of three *radio sets*.

4. Technical Characteristics

a. Transmitter, Radio T-302(*)/TRC.

Frequency range:

Amplifier, Radio Frequency

AM-1180/GRC (A-band):

Frequency range..... 50 to 100 mcs.

Number of channels..... 200.

Channel separation..... 0.25 mcs.

Amplifier, Radio Frequency AM-912(*)/TRC (B-band):

Frequency range..... 100 to 225 mcs.

Number of channels..... 250.

Channel separation..... 0.5 mcs.

Amplifier-Multiplier, Radio Frequency AM-915(*)/TRC (C-band):

Frequency range..... 225 to 400 mcs.

Number of channels..... 175.

Channel separation..... 1 mcs.

Amplifier-Multiplier, Radio Frequency AM-1178/GRC (D-band):

Frequency range..... 400 to 600 mcs.

Number of channels..... 133.

Channel separation..... 1.5 mcs.

Amplifier-Converter AM-2537/TRA-25 (F-band (low)):

Frequency range..... 790 to 915 mcs.

Number of channels..... 250.

Channel separation..... 0.05 mcs.

Amplifier-Converter AM-2537/TRA-25 (F-band (high)):

Frequency range..... 840 to 925 mcs.

Number of channels..... 250.

Channel separation..... 0.05 mcs.

Transmitter type..... Reactance tube modulated oscillator.

Power output..... 50 to 120 w.

Type of modulation..... Fm.

Type of transmission..... Voice and multichannel carrier.

Number of carrier channels..... 12 max.

Base-band frequency range:

Equipment bearing Order No.

39906-PP-58..... 250 to 108,000 cps.

All other equipments..... 250 to 68,000 cps.

Voltage requirements:

Filaments..... 2.5 and 6.3 v, 50 to 60 cps.

Blower motors..... 115 v, 50 to 60 cps.

B+..... 150, 250, and 750 vdc.

Input impedance..... 135 or 600 ohms.

Output impedance..... 52 ohms.

Transmission range (line of sight)..... 30 mi approx.

Frequency stability..... Crystal-controlled, afc circuits.

Number of tubes when used with:

AM-912(*)/TRC or AM-1180/GRC..... 26.

AM-915(*)/TRC or AM-1178/GRC..... 27.

AM-2537/TRA-25..... 31.

b. Receiver, Radio R-417(*)/TRC.

Frequency range:

Amplifier-Converter AM-1179/GRC (A-band).....

50 to 100 mcs.

Amplifier-Converter AM-913/TRC (B-band).....

100 to 225 mcs.

Amplifier-Converter AM-914/TRC (C-band).....

225 to 400 mcs.

Amplifier-Converter AM-1177/ GRC (D-band).....	400 to 600 mcs.	Intermediate frequency.....	30 mcs.
Amplifier-Converter AM-913/ TRC with Mixer Stage, Fre- quency CV-932/TRA-25 (F- band).....	790 to 965 mcs.	Voltage requirements.....	115 v, 50 to 60 cps, —12 vdc.
Receiver type.....	Superheterodyne.	Power consumption.....	185 w.
Type of reception.....	Frequency modulated carrier.	Order-wire signalling circuit frequency.....	1,600 cps.
Base-band frequency range:		Number of tubes:	
Equipment bearing Order No. 39906-PP-58.....	250 to 108,000 cps.	AM-1179/GRC.....	31.
All other equipments.....	250 to 68,000 cps.	AM-913/TRC.....	30.
Input impedance.....	52 ohms.	AM-914/TRC.....	33.
Output impedance.....	135 or 600 ohms.	AM-1177/GRC.....	32.
		AM-913/TRC with CV-932/ TRA-25.....	31.
		Frequency control.....	Afc.
		Gain control.....	Age- and manual-gain control.

c. RF Channel Number Frequency Assignment for T-302()/TRC and R-417(*)/TRC.*

RF channel No.		A-band (50-100 mc)	B-band (100-225 mc)	C-band (225-400 mc)	D-band (400-600 mc)	F-band	
Odd	Even					Low (790-915 mc)	High (840-965 mc)
1		50.125	100.250			790.500	840.500
	2	50.375	100.750			791.000	841.000
3		50.625	101.250			791.500	841.500
	4	50.875	101.750			792.000	842.000
5		51.125	102.250			792.500	842.500
	6	51.375	102.750			793.000	843.000
7		51.625	103.250			793.500	843.500
	8	51.875	103.750			794.000	844.000
9		52.125	104.250			794.500	844.500
	10	52.375	104.750			795.000	845.000
11		52.625	105.250			795.500	845.500
	12	52.875	105.750			796.000	846.000
13		53.125	106.250			796.500	846.500
	14	53.375	106.750			797.000	847.000
15		53.625	107.250			797.500	847.500
	16	53.875	107.750			798.000	848.000
17		54.125	108.250			798.500	848.500
	18	54.375	108.750			799.000	849.000
19		54.625	109.250			799.500	849.500
	20	54.875	109.750			800.000	850.000
21		55.125	110.250			800.500	850.500
	22	55.375	110.750			801.000	851.000
23		55.625	111.250			801.500	851.500
	24	55.875	111.750			802.000	852.000
25		56.125	112.250			802.500	852.500
	26	56.375	112.750	225.500		803.000	853.000
27		56.625	113.250	226.500		803.500	853.500
	28	56.875	113.750	227.500		804.000	854.000
29		57.125	114.250	228.500		804.500	854.500
	30	57.375	114.750	229.500		805.000	855.000
31		57.625	115.250	230.500		805.500	855.500
	32	57.875	115.750	231.500		806.000	856.000
33		58.125	116.250	232.500		806.500	856.500
	34	58.375	116.750	233.500		807.000	857.000
35		58.625	117.250	234.500		807.500	857.500
	36	58.875	117.750	235.500		808.000	858.000
37		59.125	118.250	236.500		808.500	858.500
	38	59.375	118.750	237.500		809.000	859.000
39		59.625	119.250	238.500		809.500	859.500
	40	59.875	119.750	239.500		810.000	860.000

RF channel No.		A-band (50-100 mc)	B-band (100-225 mc)	C-band (225-400 mc)	D-band (400-600 mc)	F-band	
Odd	Even					Low (790-915 mc)	High (840-965 mc)
41	-----	60.125	120.250	240.500	-----	810.500	860.500
	42	60.375	120.750	241.500	-----	811.000	861.000
43	-----	60.625	121.250	242.500	-----	811.500	851.500
	44	60.875	121.750	243.500	-----	812.000	862.000
45	-----	61.125	122.250	244.500	-----	812.500	862.500
	46	61.375	122.750	245.500	-----	813.000	863.000
47	-----	61.625	123.250	246.500	-----	813.500	863.500
	48	61.875	123.750	247.500	-----	814.000	864.000
49	-----	62.125	124.250	248.500	-----	814.500	864.500
	50	62.375	124.750	249.500	-----	815.000	865.000
51	-----	62.625	125.250	250.500	-----	815.500	865.500
	52	62.875	125.750	251.500	-----	816.000	866.000
53	-----	63.125	126.250	252.500	-----	816.500	866.500
	54	63.375	126.750	253.500	-----	817.000	867.000
55	-----	63.625	127.250	254.500	-----	817.500	867.500
	56	63.875	127.750	255.500	-----	818.000	868.000
57	-----	64.125	128.250	256.500	-----	818.500	868.500
	58	64.375	128.750	257.500	-----	819.000	869.000
59	-----	64.625	129.250	258.500	-----	819.500	869.500
	60	64.875	129.750	259.500	-----	820.000	870.000
61	-----	65.125	130.250	260.500	-----	820.500	870.500
	62	65.375	130.750	261.500	-----	821.000	871.000
63	-----	65.625	131.250	262.500	-----	821.500	871.500
	64	65.875	131.750	263.500	-----	822.000	872.000
65	-----	66.125	132.250	264.500	-----	822.500	872.500
	66	66.375	132.750	265.500	-----	823.000	873.000
67	-----	66.625	133.250	266.500	-----	823.500	873.500
	68	66.875	133.750	267.500	401.250	824.000	874.000
69	-----	67.125	134.250	268.500	402.750	824.500	874.500
	70	67.375	135.750	269.500	404.250	825.000	875.000
71	-----	67.625	135.250	270.500	405.750	825.500	875.500
	72	67.875	135.750	271.500	407.250	826.000	876.000
73	-----	68.125	136.250	272.500	408.750	826.500	876.500
	74	68.375	136.750	273.500	410.250	827.000	877.000
75	-----	68.625	137.250	274.500	411.750	827.500	877.500
	76	68.875	137.750	275.500	413.250	828.000	878.000
77	-----	69.125	138.250	276.500	414.750	828.500	878.500
	78	69.375	138.750	277.500	416.250	829.000	979.000
79	-----	69.625	139.250	278.500	417.750	829.500	879.500
	80	69.875	139.750	279.500	419.250	830.000	880.000
81	-----	70.125	140.250	280.500	420.750	830.500	880.500
	82	70.375	140.750	281.500	422.250	831.000	881.000
83	-----	70.625	141.250	282.500	423.750	831.500	881.500
	84	70.875	141.750	283.500	425.250	832.000	882.000
85	-----	71.125	142.250	284.500	426.750	832.500	882.500
	86	71.375	142.750	285.500	428.250	833.000	883.000
87	-----	71.625	143.250	286.500	429.750	833.500	883.500
	88	71.875	143.750	287.500	431.250	834.000	884.000
89	-----	72.125	144.250	288.500	432.750	834.500	884.500
	90	72.375	144.750	289.500	434.250	835.000	885.000
91	-----	72.625	145.250	290.500	435.750	835.500	885.500
	92	72.875	145.750	291.500	437.250	836.000	886.000
93	-----	73.125	146.250	292.500	438.750	836.500	886.500
	94	73.375	146.750	293.500	440.250	837.000	887.000
95	-----	73.625	147.250	294.500	441.750	837.500	887.500
	96	73.875	147.750	295.500	443.250	838.000	888.000
97	-----	74.125	148.250	296.500	444.750	838.500	888.500
	98	74.375	148.750	297.500	446.250	839.000	889.000

RF channel No.		A-band (50-100 mc)	B-band (100-225 mc)	C-band (225-400 mc)	D-band (400-600 mc)	F-band	
Odd	Even					Low (790-915 mc)	High (840-965 mc)
99	-----	74.625	149.250	298.500	447.750	839.500	889.500
	100	74.875	149.750	299.500	449.250	840.000	890.000
101	-----	75.125	150.250	300.500	450.750	840.500	890.500
	102	75.375	150.750	301.500	452.250	841.000	891.000
103	-----	75.625	151.250	302.500	453.750	841.500	891.500
	104	75.875	151.750	303.500	455.250	842.000	892.000
105	-----	76.125	152.250	304.500	456.750	842.500	892.500
	106	76.375	152.750	305.500	458.250	843.000	893.000
107	-----	76.625	153.250	306.500	459.750	843.500	893.500
	108	76.875	153.750	307.500	461.250	844.000	894.000
109	-----	77.125	154.250	308.500	462.750	844.500	894.500
	110	77.375	154.750	309.500	464.250	845.000	895.000
111	-----	77.625	155.250	310.500	465.750	845.500	895.500
	112	77.875	155.750	311.500	467.250	846.000	896.000
113	-----	78.125	156.250	312.500	468.750	846.500	896.500
	114	78.375	156.750	313.500	470.250	847.000	897.000
115	-----	78.625	157.250	314.500	471.750	847.500	897.500
	116	78.875	157.750	315.500	473.250	848.000	898.000
117	-----	79.125	158.250	316.500	474.750	848.500	898.500
	118	79.375	158.750	317.500	476.250	849.000	899.000
119	-----	79.625	159.250	318.500	477.750	849.500	899.500
	120	79.875	159.750	319.500	479.250	850.000	900.000
121	-----	80.125	160.250	320.500	480.750	850.500	900.500
	122	80.375	160.750	321.500	482.250	851.000	901.000
123	-----	80.625	161.250	322.500	483.750	851.500	901.500
	124	80.875	161.750	323.500	485.250	852.000	902.000
125	-----	81.125	162.250	324.500	486.750	852.500	902.500
	126	81.375	162.750	325.500	488.250	853.000	903.000
127	-----	81.625	163.250	326.500	489.750	853.500	903.500
	128	81.875	163.750	327.500	491.250	854.000	904.000
129	-----	82.125	164.250	328.500	492.750	854.500	904.500
	130	82.375	164.750	329.500	494.250	855.000	905.000
131	-----	82.625	165.250	330.500	495.750	855.500	905.500
	132	82.875	165.750	331.500	497.250	856.000	906.000
133	-----	83.125	166.250	332.500	498.750	856.500	906.500
	134	83.375	166.750	333.500	500.250	857.000	907.000
135	-----	83.625	167.250	334.500	501.750	857.500	907.500
	136	83.875	167.750	335.500	503.250	858.000	908.000
137	-----	84.125	168.250	336.500	504.750	858.500	908.500
	138	84.375	168.750	337.500	506.250	859.000	909.000
139	-----	84.625	169.250	338.500	507.750	859.500	909.500
	140	84.875	169.750	339.500	509.250	860.000	910.000
141	-----	85.125	170.250	340.500	510.750	860.500	910.500
	142	85.375	170.750	341.500	512.250	861.000	911.000
143	-----	85.625	171.250	342.500	513.750	861.500	911.500
	144	85.875	171.750	343.500	515.250	862.000	912.000
145	-----	86.125	172.250	344.500	516.750	862.500	912.500
	146	86.375	172.750	345.500	518.250	863.000	913.000
147	-----	86.625	173.250	346.500	519.750	863.500	913.500
	148	86.875	173.750	347.500	521.250	864.000	914.000
149	-----	87.125	174.250	348.500	522.750	864.500	914.500
	150	87.375	174.750	349.500	524.250	865.000	915.000
151	-----	87.625	175.250	350.500	525.750	865.500	915.050
	152	87.875	175.750	351.500	527.250	866.000	916.000
153	-----	88.125	176.250	352.500	528.750	866.500	916.500
	154	88.375	176.750	353.500	530.250	867.000	917.000
155	-----	88.625	177.250	354.500	531.750	867.500	917.500
	156	88.875	177.750	355.500	533.250	868.000	918.000

RF channel No.		A-band (50-100 mc)	B-band (100-225 mc)	C-band (225-400 mc)	D-band (400-600 mc)	F-band	
Odd	Even					Low (790-915 mc)	High (840-965 mc)
157	-----	89.125	178.250	356.500	534.750	868.500	918.500
	158	89.375	178.750	357.500	536.250	869.000	919.000
159	-----	89.625	179.250	358.500	537.750	869.500	919.500
	160	89.875	179.750	359.500	539.250	870.000	920.000
161	-----	90.125	180.250	360.500	540.750	870.500	920.500
	162	90.375	180.750	361.500	542.250	871.000	921.000
163	-----	90.625	181.250	362.500	543.750	871.500	921.500
	164	90.875	181.750	363.500	545.250	872.000	922.000
165	-----	91.125	182.250	364.500	546.750	872.500	922.500
	166	91.375	182.750	365.500	548.250	873.000	923.000
167	-----	91.625	183.250	366.500	549.750	873.500	923.500
	168	91.875	183.750	367.500	551.250	874.000	924.000
169	-----	92.125	184.250	368.500	552.750	874.500	924.500
	170	92.375	184.750	369.500	554.250	875.000	925.000
171	-----	92.625	185.250	370.500	555.750	875.500	925.500
	172	92.875	185.750	371.500	557.250	876.000	926.000
173	-----	93.125	186.250	372.500	558.750	876.500	926.500
	174	93.375	186.750	373.500	560.250	877.000	927.000
175	-----	93.625	187.250	374.500	561.750	877.500	927.500
	176	93.875	187.750	375.500	563.250	878.000	928.000
177	-----	94.125	188.250	376.500	564.750	878.500	928.500
	178	94.375	188.750	377.500	566.250	879.000	929.000
179	-----	94.625	189.250	378.500	567.750	879.500	929.500
	180	94.875	189.750	379.500	569.250	880.000	930.000
181	-----	95.125	190.250	380.500	570.750	880.500	930.500
	182	95.375	190.750	381.500	572.250	881.000	931.000
183	-----	95.625	191.250	382.500	573.750	881.500	931.500
	184	95.875	191.750	383.500	575.250	882.000	932.000
185	-----	96.125	192.250	384.500	576.750	882.500	932.500
	186	96.375	192.750	385.500	578.250	883.000	933.000
187	-----	96.625	193.250	386.500	579.750	883.500	933.500
	188	96.875	193.750	387.500	581.250	884.000	934.000
189	-----	97.125	194.250	388.500	582.750	884.500	934.500
	190	97.375	194.750	389.500	584.250	885.000	935.000
191	-----	97.625	195.250	390.500	585.750	885.500	935.500
	192	97.875	195.750	391.500	587.250	886.000	936.000
193	-----	98.125	196.250	392.500	588.750	886.500	936.500
	194	98.375	196.750	393.500	590.250	877.000	937.000
195	-----	98.625	197.250	394.500	591.750	887.500	937.500
	196	98.875	197.750	395.500	593.250	888.000	938.000
197	-----	99.125	198.250	396.500	594.750	888.500	938.500
	198	99.375	198.750	397.500	596.250	889.000	939.000
199	-----	99.625	199.250	398.500	597.750	889.500	939.500
	200	99.875	199.750	399.500	599.250	890.000	940.000
201	-----		200.250			890.500	940.500
	202		200.750			891.000	941.000
203	-----		201.250			891.500	941.500
	204		201.750			892.000	942.000
205	-----		202.250			892.500	942.500
	206		202.750			893.000	943.000
207	-----		203.250			893.500	943.500
	208		203.750			894.000	944.000
209	-----		204.250			894.500	944.500
	210		204.750			895.000	945.000
211	-----		205.250			895.500	945.500
	212		205.750			896.000	946.000
213	-----		206.250			896.500	946.500
	214		206.750			897.000	947.000

RF channel No.		A-band (50-100 mc)	B-band (100-225 mc)	C-band (225-400 mc)	D-band (400-600 mc)	F-band	
Odd	Even					Low (790-915 mc)	High (840-965 mc)
215			207.250			897.500	947.500
	216		207.750			898.000	948.000
217			208.250			898.500	948.500
	218		208.750			899.000	949.000
219			209.250			899.500	949.500
	220		209.750			900.000	950.000
221			210.250			900.500	950.500
	222		210.750			901.000	951.000
223			211.250			901.500	951.500
	224		211.750			902.000	952.000
225			212.250			902.500	952.500
	226		212.750			903.000	953.000
227			213.250			903.500	953.500
	228		213.750			904.000	954.000
229			214.250			904.500	954.500
	230		214.750			905.000	955.000
231			215.250			905.500	955.500
	232		215.750			906.000	956.000
233			216.250			906.500	956.500
	234		216.750			907.000	957.000
235			217.250			907.500	957.500
	236		217.750			908.000	958.000
237			218.250			908.500	958.500
	238		218.750			909.000	959.000
239			219.250			909.500	959.500
	240		219.750			910.000	960.000
241			220.250			910.500	960.500
	242		220.750			911.000	961.000
243			221.250			911.500	961.500
	244		221.750			912.000	962.000
245			222.250			912.500	962.500
	246		222.750			913.000	963.000
247			223.250			913.500	963.500
	248		223.750			914.000	964.000
249			224.250			914.500	964.500
	250		224.750			915.000	965.000

d. *Limitations of RF Channel Number Frequency Assignments (F-band).* When the F-band transmitter head is used with the T-302(*)/TRC and the F-band receiver tuning head is used with the R-417(*)/TRC, the R-417(*)/TRC at the T-302(*)/TRC site, will receive interference from the T-302(*)/TRC in some instances. This interference will be produced only if the T-302(*)/TRC and the R-417(*)/TRC are tuned to certain RF channel numbers. Consideration must be given to this factor when RF channel numbers or frequency allocations are assigned. The charts below indicate the RF channel numbers of the T-302(*)/TRC

that will produce interference in the R-417(*)/TRC and also indicates RF channel numbers of the R-417(*)/TRC that will receive the interference. The chart in (1) below lists the RF channel numbers for the F-band (*low*) and the chart in (2) below lists the RF channel numbers for the F-band (*high*). Interference will also occur when the R-417(*)/TRC and the T-302(*)/TRC are operated on even adjacent RF channel numbers.

Note. The RF channel numbers listed in the *Weak* column for the T-302(*)/TRC will produce interference of 6 microvolts or less in the R-147(*)/TRC.

(1) *F*-band (low).

T-302(*)/TRC RF channel number producing interference		R-417(*)/TRC RF channel number receiving interference	T-302(*)/TRC RF channel number producing interference		R-417(*)/TRF RF channel number receiving interference
Weak	Strong		Weak	Strong	
			83	115, 155	115
	1, 193, 195	1	83	117, 155, 225	117
	3, 193, 195	3		119, 155, 225	119
65	5, 193, 197	5		121, 153, 225	121
65	7, 191, 197	7		123, 153	123
65	9, 191, 197	9	85	125, 153, 227	125
	11, 191	11	85	127, 151, 227	127
	13, 189, 199	13	85	129, 151, 227	129
	15, 189, 199	15		131, 151	131
67	17, 189, 199	17		133, 149, 229	133
67	19, 187	19		135, 149, 229	135
67	21, 187, 201	21	87	137, 149, 229	137
	23, 187, 201	23	87	139, 147	139
	25, 185, 201	25	87	141, 147, 231	141
	27, 185	27		143, 147, 231	143
1-249	29, 185, 203	29 ^a		145, 231	145
1-249	31, 183, 203	31 ^a		145, 147	147
69	33, 183, 203	33	89	145, 149, 233	149
	35, 183	35	89	143, 151, 233	151
	37, 181, 205	37	89	143, 153, 233	153
	39, 181, 205	39		143, 155	155
71	41, 181, 205	41		141, 157, 235	157
71	43, 179	43		141, 159, 235	159
71	45, 179, 207	45	91	141, 161, 235	161
	47, 179, 207	47	91	139, 163	163
	49, 177, 207	49	91	139, 165, 237	165
	51, 177	51		139, 167, 237	167
73	53, 177, 209	53		137, 169, 237	169
73	55, 175, 209	55		137, 171	171
73	57, 175, 209	57	93	137, 173, 239	173
	59, 175	59	93	135, 175, 239	175
	61, 173, 211	61	93	135, 177, 239	177
	63, 173, 211	63		135, 179	179
75	65, 173, 211	65		133, 181, 241	181
75	67, 171	67		133, 183, 241	183
75	69, 171, 213	69	95	133, 185, 241	185
	71, 171, 213	71	95	131, 187	187
	73, 169, 213	73	95	131, 189, 243	189
	75, 169	75		131, 191, 243	191
77	79, 169, 215	77		129, 193, 243	193
77	79, 167, 215	79		129, 195	195
77	81, 167, 215	81	97	129, 197, 245	197
	83, 167	83	97	127, 199, 245	199
	85, 165, 217	85	1, 97	127, 201, 245	201
	87, 165, 217	87	97	127, 203	203
79	89, 165, 217	89	3	125, 205, 247	205
79	91, 168	91		125, 207, 247	207
79	93, 163, 219	93	5, 99	125, 209, 247	209
	95, 163, 219	95	99	123, 211	211
	97, 161, 219	97	7, 99	123, 213, 249	213
	99, 161	99		123, 215, 249	215
81	101, 161, 221	101	9	121, 217, 249	217
81	103, 159, 221	103		121, 219	219
81	105, 159, 221	105	11, 101	121, 221	221
1-249	107, 159	107 ^b	101	119, 223	223
	109, 157, 223	109	13, 101	119, 225	225
	111, 157, 223	111		119, 227	227
83	113, 157, 223	113			

T-302(*)/TRC RF channel number producing interference		R-417(*)/TRC RF channel number receiving interference
Weak	Strong	
15	117, 229	229
	117, 231	231
17, 103	117, 233	233
103	115, 235	235
19, 103	115, 237	237
	115, 239	239
21	113, 241	241
	113, 243	243
23, 105	113, 245	245
105	111, 247	247
25, 105	111, 249	249

* Do not use RF channel numbers 29 or 31 on T-302(*)/TRC or R-147(*)/TRC.

° Use RF channel number 107 on R-417(*)/TRC only for short distances. RF channel number 107 (low) band may be used on T-302(*)/TRC with RF channel number 7 (high) band on R-417(*)/RTC.

(2) *F-band (high).*

T-302(*)/TRC RF channel number producing interference		R-417(*)/TRF RF channel number receiving interference
Weak	Strong	
13, 81	1, 221, 227	1
13, 81	3, 221, 227	3
13, 81	5, 119, 221, 225	5
13	7, 119, 225	7
13	9, 119, 223, 225	9
13	11, 223	11
11, 83	13, 117, 223	13
11, 83	15, 117, 223	15
11, 83	17, 117, 223, 225	17
11	19, 221, 225	19
11	21, 115, 221, 225	21
11	23, 115, 219	23
9, 85	25, 115, 219, 227	25
9, 85	27, 219, 227	27
9, 85	29, 113, 217, 227	29
9	31, 113, 217	31
9	33, 113, 217, 229	33
9	35, 215, 229	35
7, 87	37, 111, 215, 229	37
7, 87	39, 111, 215	39
7, 87	41, 111, 213, 231	41
7	43, 213, 231	43
7	45, 109, 213, 231	45
1-249	47, 209, 221	47 ^a
1-249	49, 109, 211, 233	49 ^a
5, 89	51, 211, 233	51
5, 89	53, 107, 209, 233	53
5	55, 107, 209	55
5	57, 107, 209, 235	57
5	59, 207, 235	59
3, 91	61, 105, 207, 235	61
3, 91	63, 105, 207	63
3, 91	65, 105, 205, 237	65
3	67, 205, 237	67

T-302(*)/TRC RF channel number producing interference		R-417(*)/TRC RF channel number receiving interference
Weak	Strong	
3	69, 103, 205, 237	69
3	71, 103, 203	71
1, 93	73, 103, 203, 239	73
1, 93	75, 203, 239	75
1, 93	79, 101, 201, 239	77
1	79, 101, 201	79
	81, 101, 201, 241	81
	83, 199, 241	83
95	85, 99, 199, 241	85
95	87, 99, 199	87
95	89, 99, 197, 243	89
	91, 197, 243	91
	93, 97, 197, 243	93
	95, 97, 195	95
97	97, 195, 245	97
97	99, 195, 245	99
97	95, 101, 193, 245	101
	95, 103, 193	103
	95, 105, 193, 247	105
	107, 191, 247	107
99	93, 109, 191, 247	109
99	93, 111, 191	111
99	93, 113, 189, 249	113
	115, 189, 249	115
	91, 117, 189, 249	117
	91, 119, 187	119
	91, 121, 187	121
101	123, 187	123
101	89, 125, 185	125
	89, 127, 185	127
1-249	89, 129, 185	129 ^b
	131, 183	131
103	87, 133, 183	133
103	87, 135, 183	135
103	87, 137, 181	137
	139, 181	139
	85, 141, 181	141
	85, 143, 179	143
105	85, 145, 179	145
105	147, 179	147
105	83, 149, 177	149
	83, 151, 177	151
	83, 153, 177	153
	155, 175	155
107	81, 157, 175	157
107	81, 159, 175	159
107	81, 161, 173	161
	163, 173	163
	79, 165, 173	165
	79, 167, 171	167
109	79, 169, 171	169
109	171	171
109	77, 169, 173	173
	77, 169, 175	175
	77, 169, 177	177
	167, 179	179
111	75, 167, 181	181
111	75, 167, 183	183

T-302(*)/TRC RF channel number producing interference		R-417(*)/TRF RF channel number receiving interference
Weak	Strong	
111	75, 165, 185 165, 187 73, 165, 189 73, 163, 191	185 187 189 191
113	73, 163, 193	193
113	163, 195	195
113	71, 161, 197 71, 161, 199	197 199
1	71, 161, 201 159, 103	201 203
3, 115	69, 159, 205	205
115	69, 159, 207	207
5, 115	69, 157, 209 157, 211	209 211
7	67, 157, 213 67, 155, 215	213 215
9, 117	67, 155, 217	217
117	155, 219	219
11, 117	65, 153, 221 65, 153, 223	221 223
13	65, 153, 225 151, 227	225 227
15, 119	63, 151, 229	229
119	63, 151, 231	231
17, 119	63, 149, 233 149, 235	233 235
19	61, 149, 237 61, 147, 239	237 239
21, 121	61, 147, 241	241
121	147, 243	243
23, 121	51, 145, 245 59, 145, 247	245 247
25	145, 249	249

* Do not use RF channel numbers 47 or 49 on T-302(*)/TRC or R-417(*)/TRC.

† Use RF channel number 129 on R-417(*)/TRC only for short distances. RF channel number 129 (high) band may be used on T-302(*)/TRC with RF channel number 229 (low) band on R-417(*)/TRC.

e. Power Supply PP-685(*)/TRC.

Power requirements	115 v, 50 to 60 cps, 10 amp.
Power output (dc):	
Regulated	150 v, 275 ma. 200 to 350 v, 35 ma.
Unregulated	250 v, 10 ma, 300 to 900 v, 500 ma, —12 v, 75 ma.
Power output (ac)	2.5 v, 6.25 amp, 6.3 v, 12 amp, 115 v, 2 amp.
Number of tubes	10.

f. Transformer, Power, Fixed Auto Transformer TF-167/TRC.

Input voltage	95 to 130 v or 190 to 260 v, 50 to 60 cps.
---------------	---

Output voltage	115 v, ± 5.5 v, 50 to 60 cps, 16 amp.
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g. Interconnecting Box J-532/U.

Input voltage	95 to 130 v or 190 to 260 v, 50 to 60 cps.
---------------	---

Output voltage:	
95 to 130 volts	10 outputs.
190 to 260 volts	6 outputs.

h. Switch Box SA-331/U.

Input voltage	95 to 130 v or 190 to 260 v, 50 to 60 cps.
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Output voltage	95 to 130 v or 190 to 260 v, 50 to 60 cps (corresponds to in- put voltage).
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i. Antenna.

Type:

Antenna AS-756/GRC (A-band)	Two three-element, yagi arrays.
Antenna AS-639/TRC (B-band)	Two half-wave di- poles with plane reflector.
Antenna AS-640/TRC (C-band)	Two half-wave di- poles with plane reflector.
Antenna AS-755/GRC (D-band)	Four half-wave di- poles with plane reflector.
Antenna Assembly AS-1082/ TRA-25 (F-band)	Two four-stacked, folded dipoles with plane reflector.

Operating frequency:

Antenna AS-756/GRC (A-band)	40 to 100 mcs.
Antenna AS-639/TRC (B-band)	100 to 250 mcs.
Antenna AS-640/TRC (C-band)	250 to 400 mcs.
Antenna AS-755/GRC (D-band)	400 to 600 mcs.
Antenna Assembly AS-1082/ TRA-25 (F-band)	790 to 965.

Polarization	Horizontal or vertical
Beam width	From 25° to 120° (varies with fre- quency and polari- zation).

Gain:

Antenna AS-756/GRC (A-band)	5 db.
Antenna AS-639/TRC (B-band)	6 db.
Antenna AS-640/TRC (C-band)	8 db.
Antenna AS-755/GRC (D-band)	10 db.
Antenna Assembly AS-1082/ TRA-25 (F-band)	12 db.

Major-to-minor lobe ratio	Greater than 8 db.
---------------------------	--------------------

Mast AB-235/G:

Type	Tubular steel.
Number of sections	9.
Maximum height	45 ft.

j. Generator Set, Gasoline Engine PU-286/G.

Refer to TM 11-940A.

5. Table of Components

The quantity of component groups comprising a radio set, a radio terminal set, a radio repeater set is provided in *a* below. The quantity

of items comprising each component group is provided in *b* below. The running spares are listed in *c* below.

a. Component Groups of Radio Set, Radio Terminal Set, Radio Relay Set, and Radio Repeater Set.

(1) *Radio sets.*

Nomenclature	Quantity	Components	Fig. No.
Radio Set AN/TRC-24	1	Radio Set Group OA-1387/GRC.....	1
	1	Power Accessories Group OA-1676/GRC.....	2
	1	Generator Set Group OA-1675/GRC.....	3
	1	Antenna Group OA-1389/GRC.....	4
	1	Antenna Accessories Group OA-1398/GRC.....	5
	1	Amplifier Group OA-1392/GRC (B-band).....	6
	1	Antenna-Filter Group OA-1393/GRC (B-band).....	7
	1	Amplifier Group OA-1394/GRC (C-band).....	8
	1	Antenna-Filter Group OA-1395/GRC (C-band).....	9
		<i>Note.</i> Radio Set Group AN/TRC-25 (F-band) is not a component of the AN/TRC-24, but is used with the AN/TRC-24 (par. 71).	10
Radio Set AN/GRC-75	1	Radio Set Group OA-1387/GRC.....	1
	1	Power Accessories Group OA-1676/GRC.....	2
	1	Generator Set Group OA-1675/GRC.....	3
	1	Antenna Accessories Group OA-1398/GRC.....	5
	1	Amplifier Group OA-1390/GRC (A-band).....	11
	1	Antenna Filter Group OA-1391/GRC (A-band).....	12
Radio Set AN/GRC-78	1	Radio Set Group OA-1387/GRC.....	1
	1	Power Accessories Group OA-1676/GRC.....	2
	1	Generator Set Group OA-1675/GRC.....	3
	1	Antenna Group OA-1389/GRC.....	4
	1	Antenna Accessories Group OA-1398/GRC.....	5
	1	Amplifier Group OA-1392/GRC (B-band).....	6
	1	Antenna-Filter Group OA-1393/GRC (B-band).....	7
	1	Amplifier Group OA-1396/GRC (D-band).....	13
	1	Antenna Filter Group OA-1397/GRC (D-band).....	14
		<i>Note.</i> Radio Set Group AN/TRC-25 (F-band) is not a component of the AN/GRC-78, but is used with the AN/GRC-78 (par. 71).	10
Radio Set AN/GRC-81	1	Radio Set Group OA-1387/GRC.....	1
	1	Power Accessories Group OA-1676/GRC.....	2
	1	Generator Set Group OA-1675/GRC.....	3
	1	Antenna Group OA-1389/GRC.....	4
	1	Antenna Accessories Group OA-1398/GRC.....	5
	1	Amplifier Group OA-1394/GRC (C-band).....	8
	1	Antenna-Filter Group OA-1395/GRC (C-band).....	9

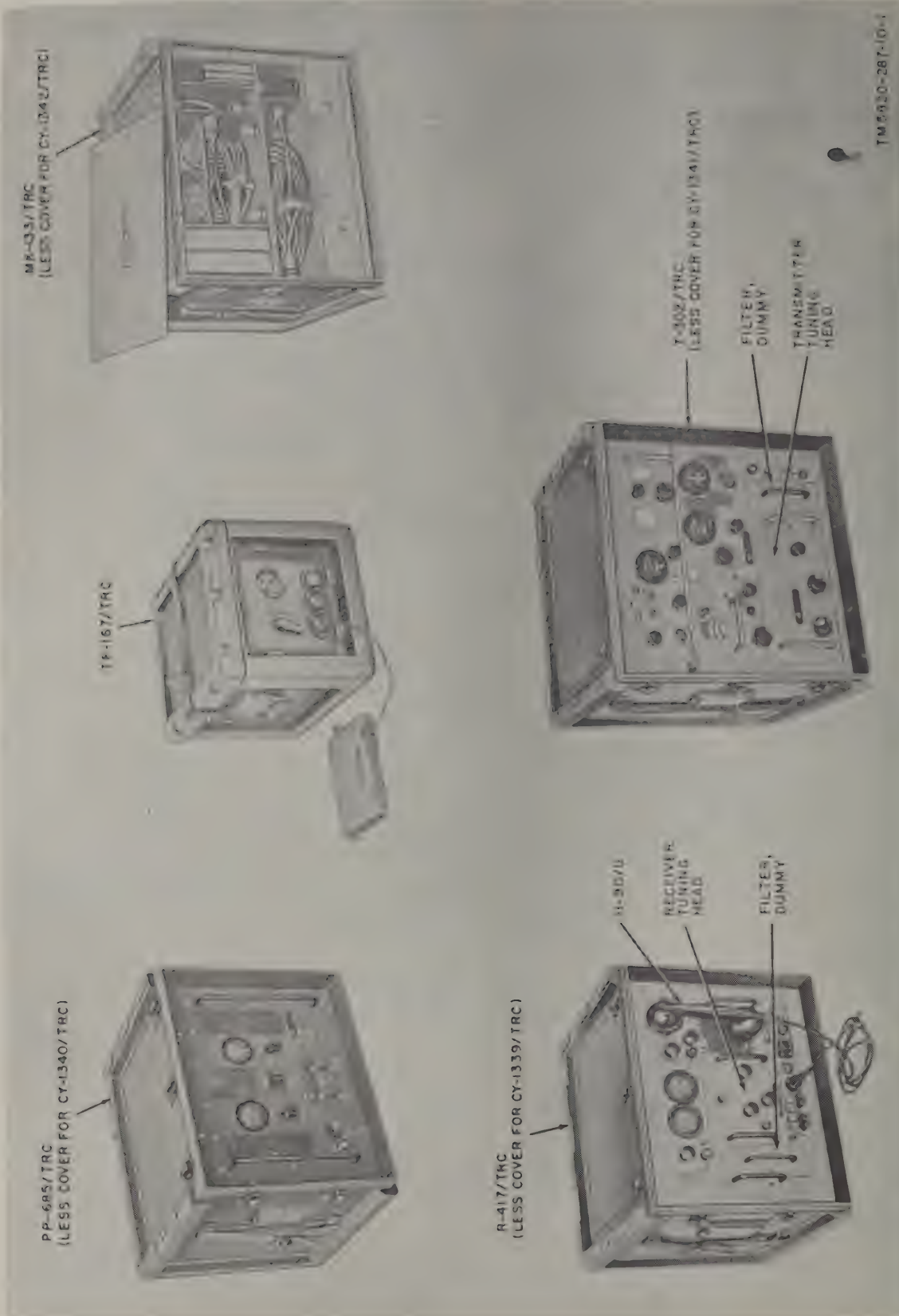


Figure 1. Radio Set Group OA-1587 G1/C with a transmitter tuning head installed in the T-302/TRC and a receiver tuning head and Handset H-3010 installed in the R-417/TRC.

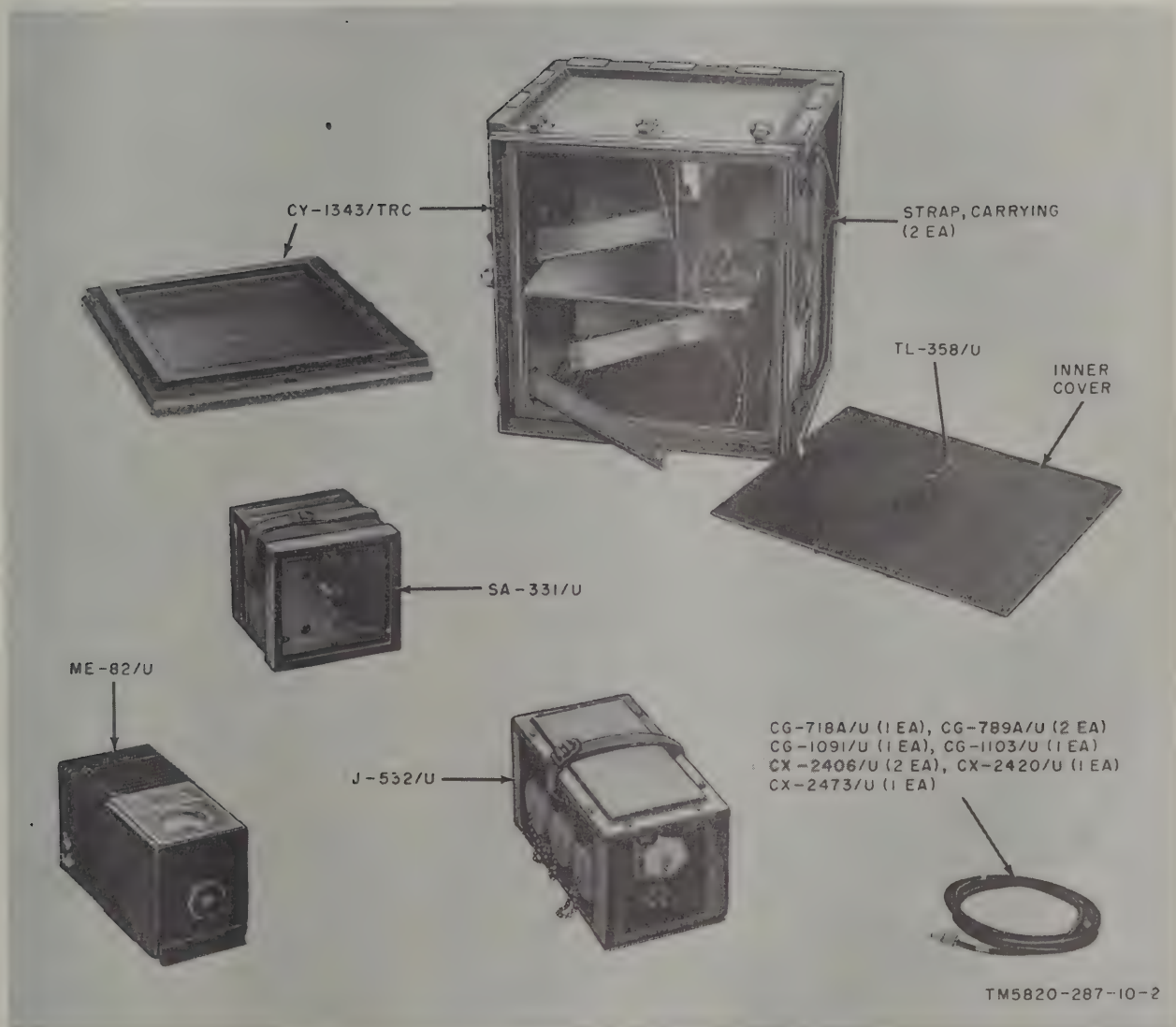


Figure 2. Power Accessories Group OA-1676/GRC.

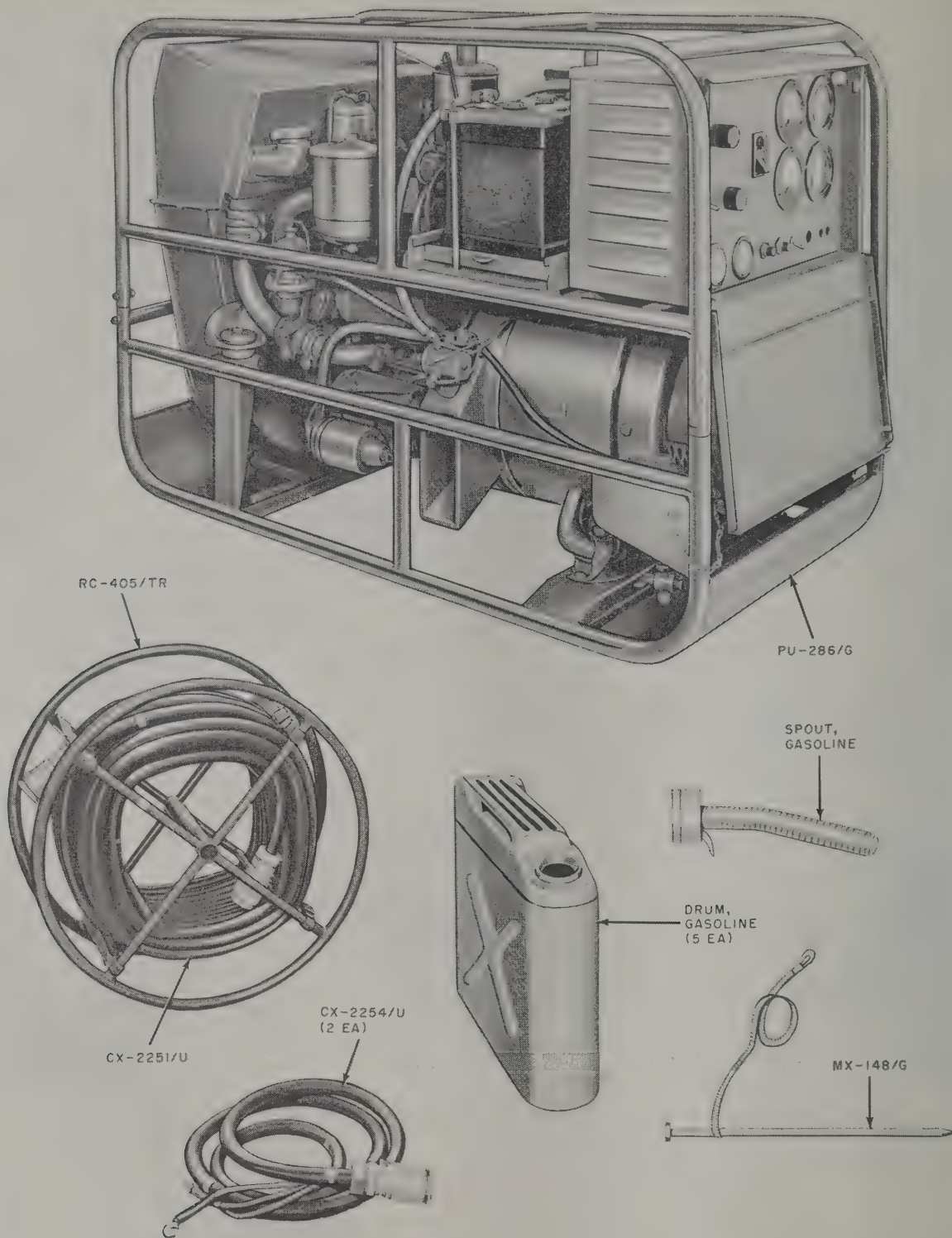
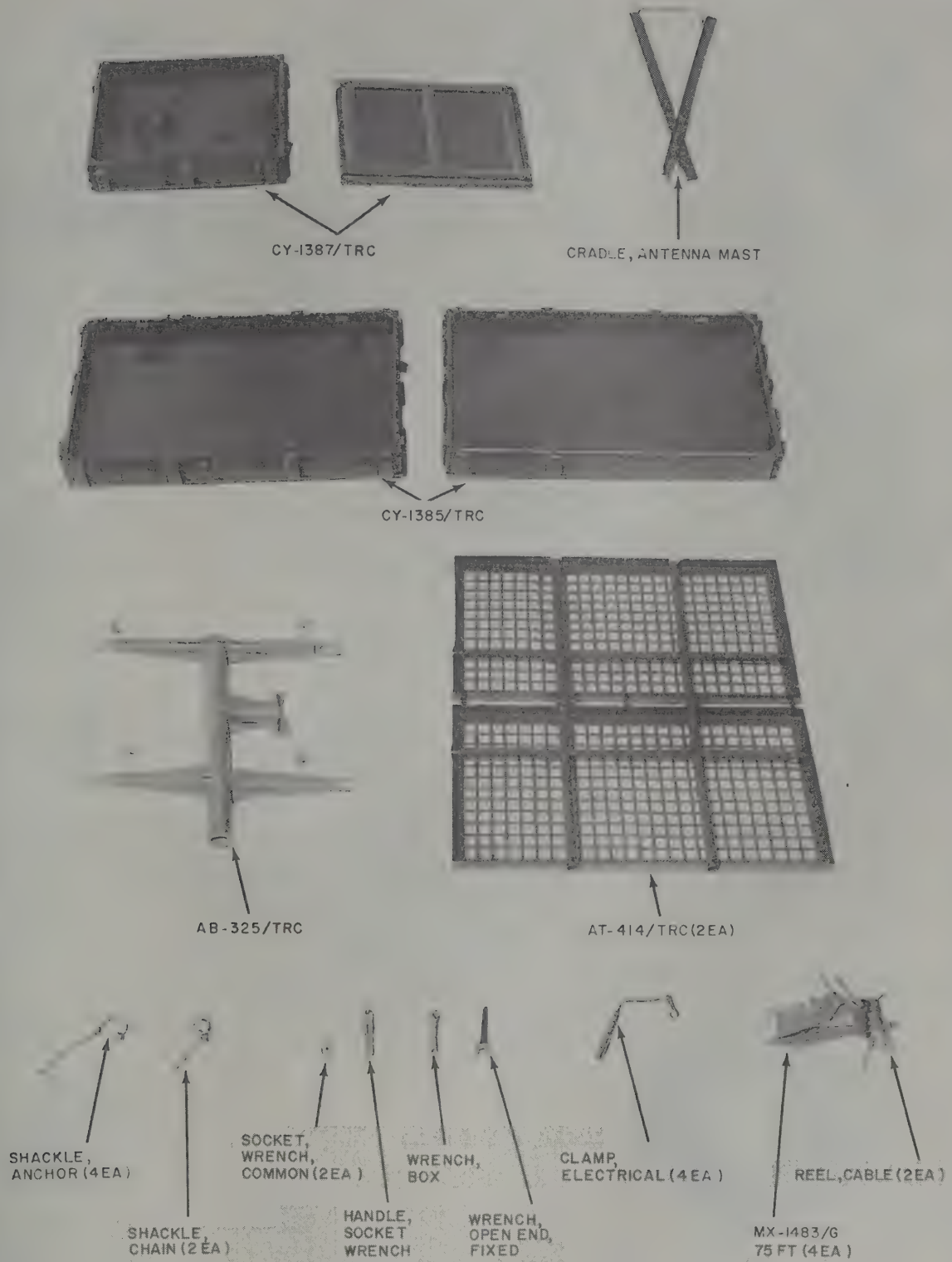


Figure 3. Generator Set Group OA-1675/GRC.



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Figure 4. Antenna Group OA-1398/GRC.

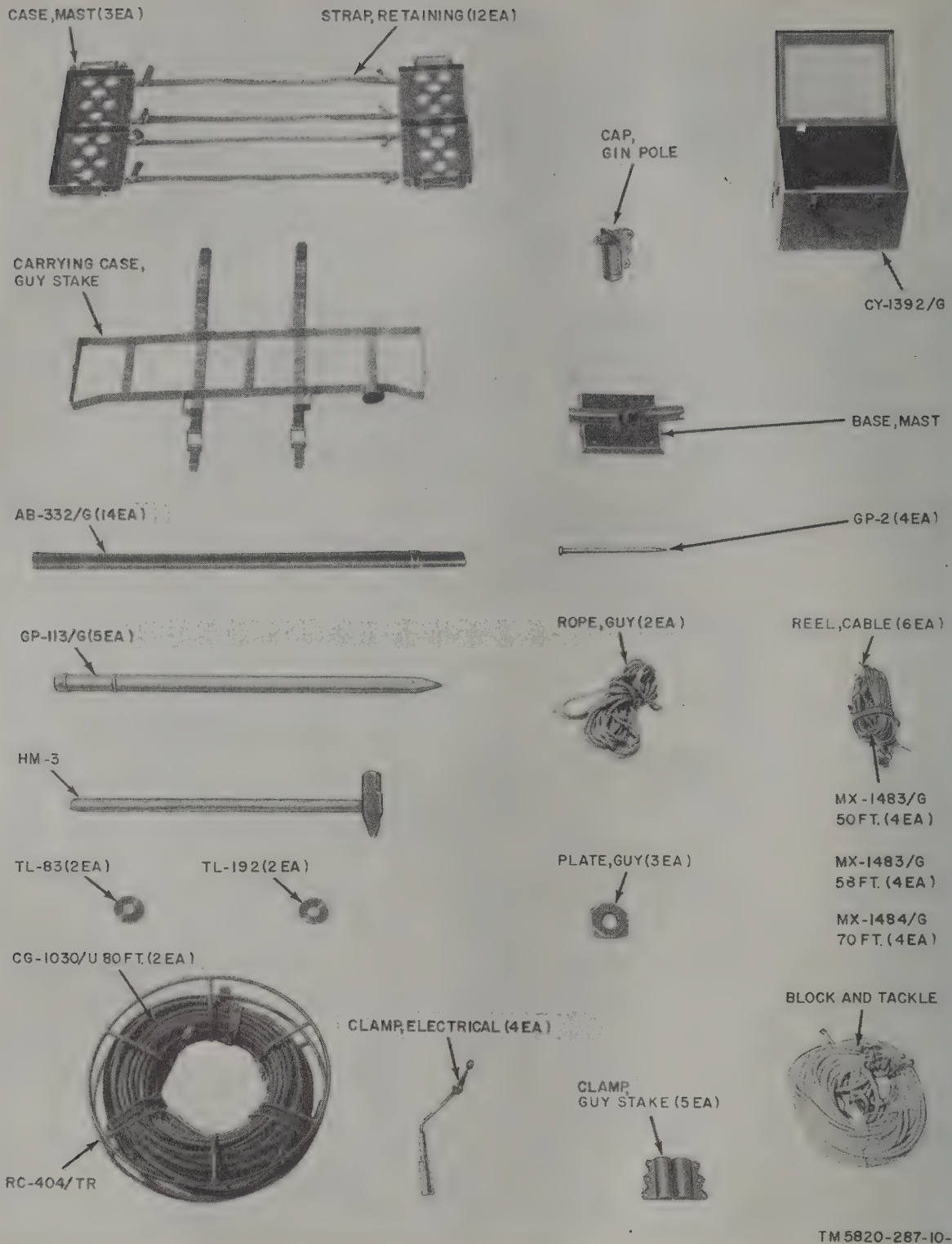


Figure 5. Antenna Accessories Group OA-1398/GKC.

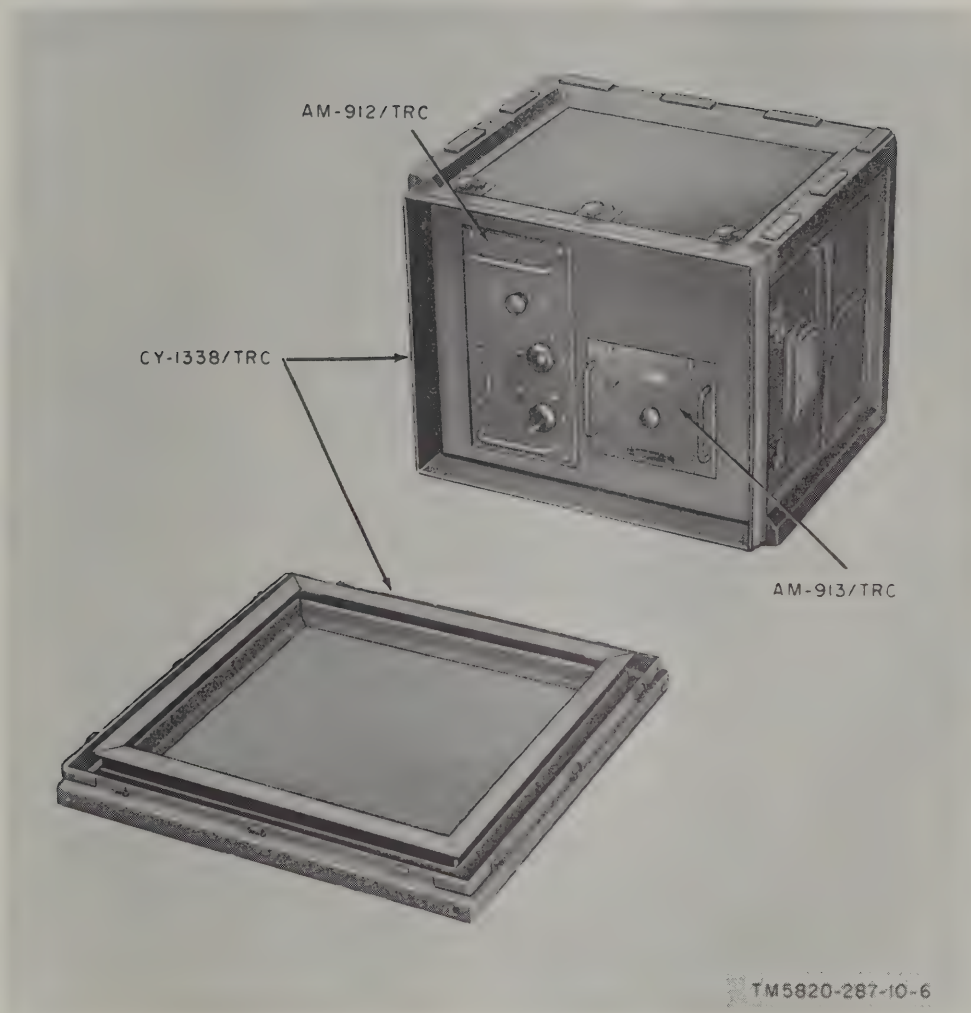
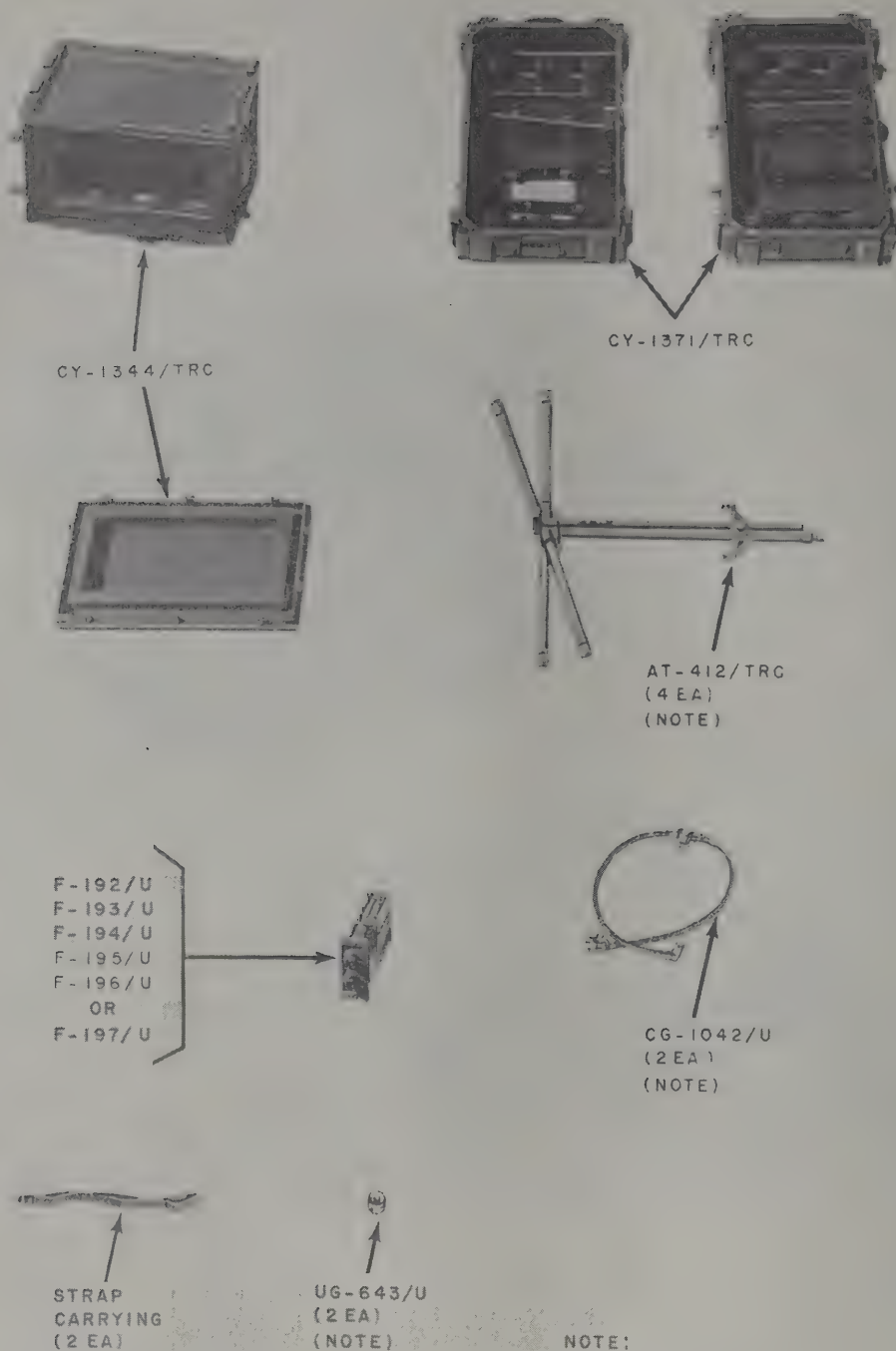


Figure 6. Amplifier Group OA-1392/GRC.



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Figure 7. Antenna-Filler Group OA-1393/GRC.

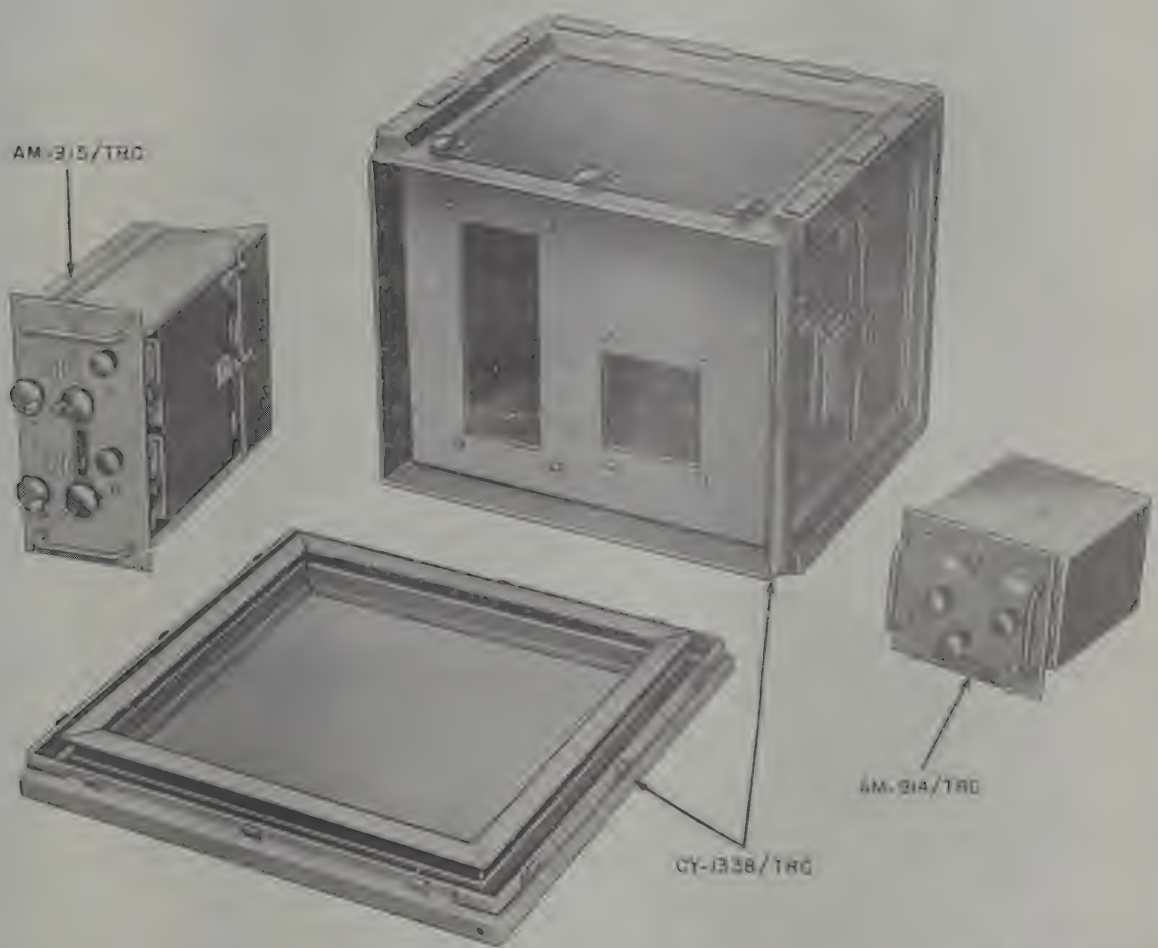


Figure 8. Amplifier Group OA-1394/GRC.

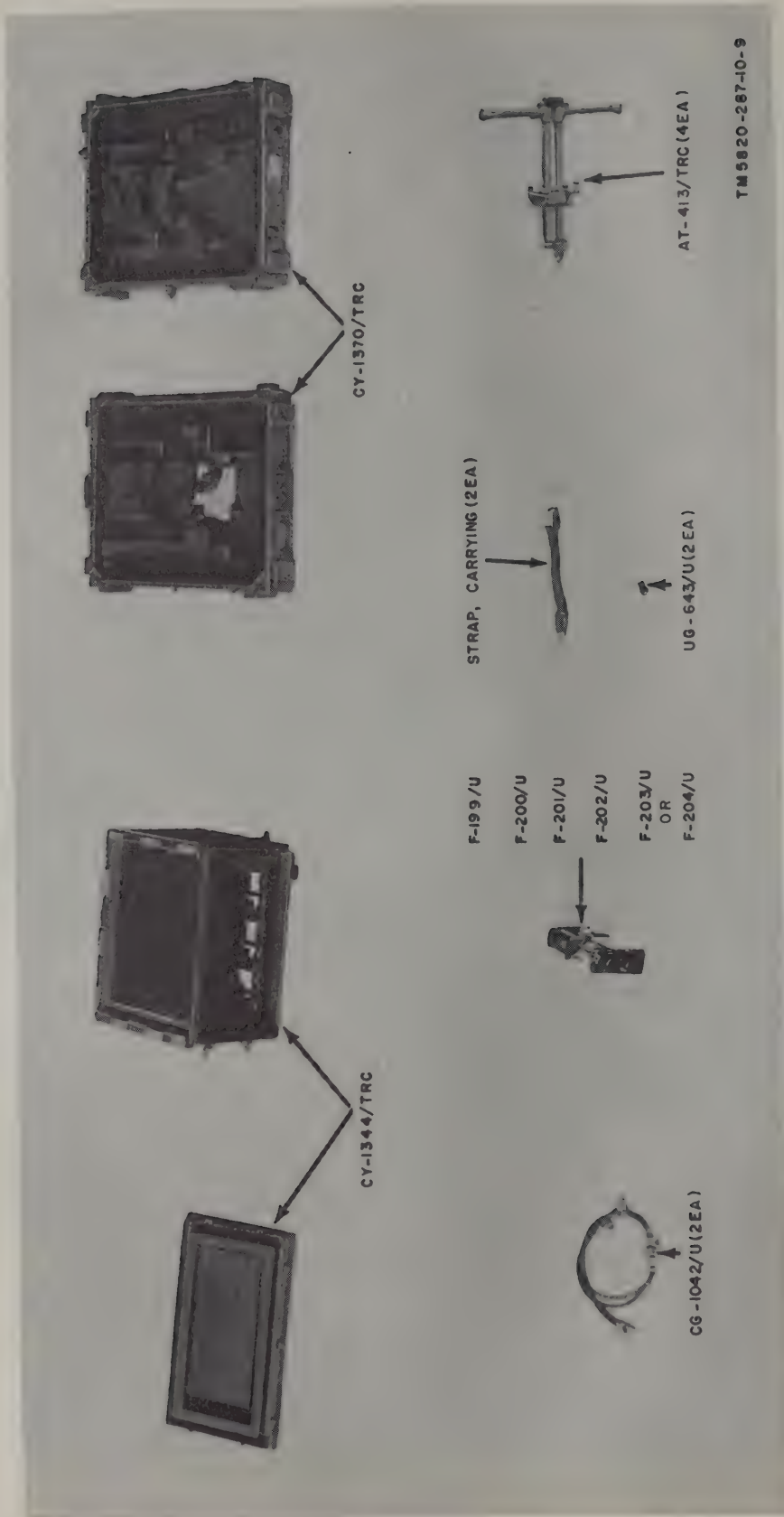
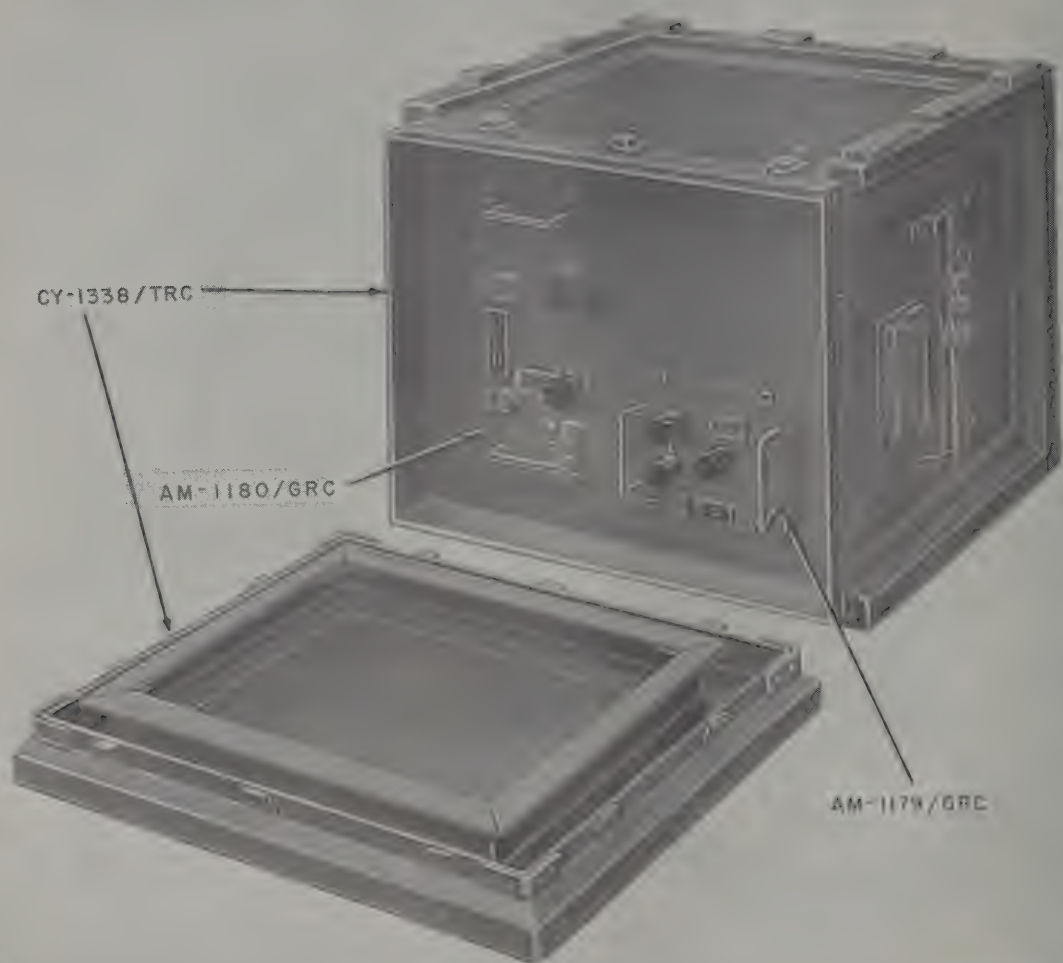


Figure 9. Antenna-Filter Group OA-1395 GRC.



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Figure 11. Amplifier Group OA-1390/GRC

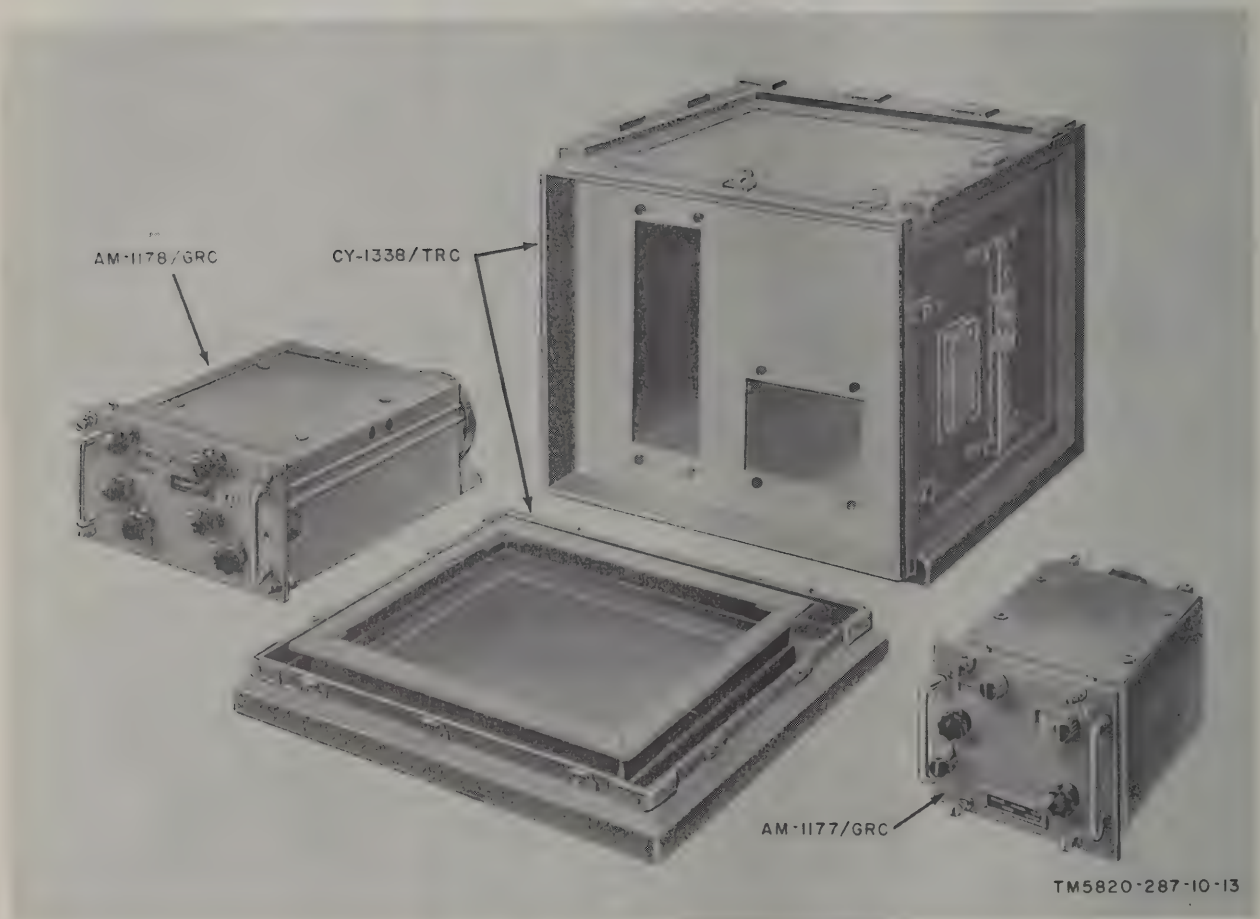
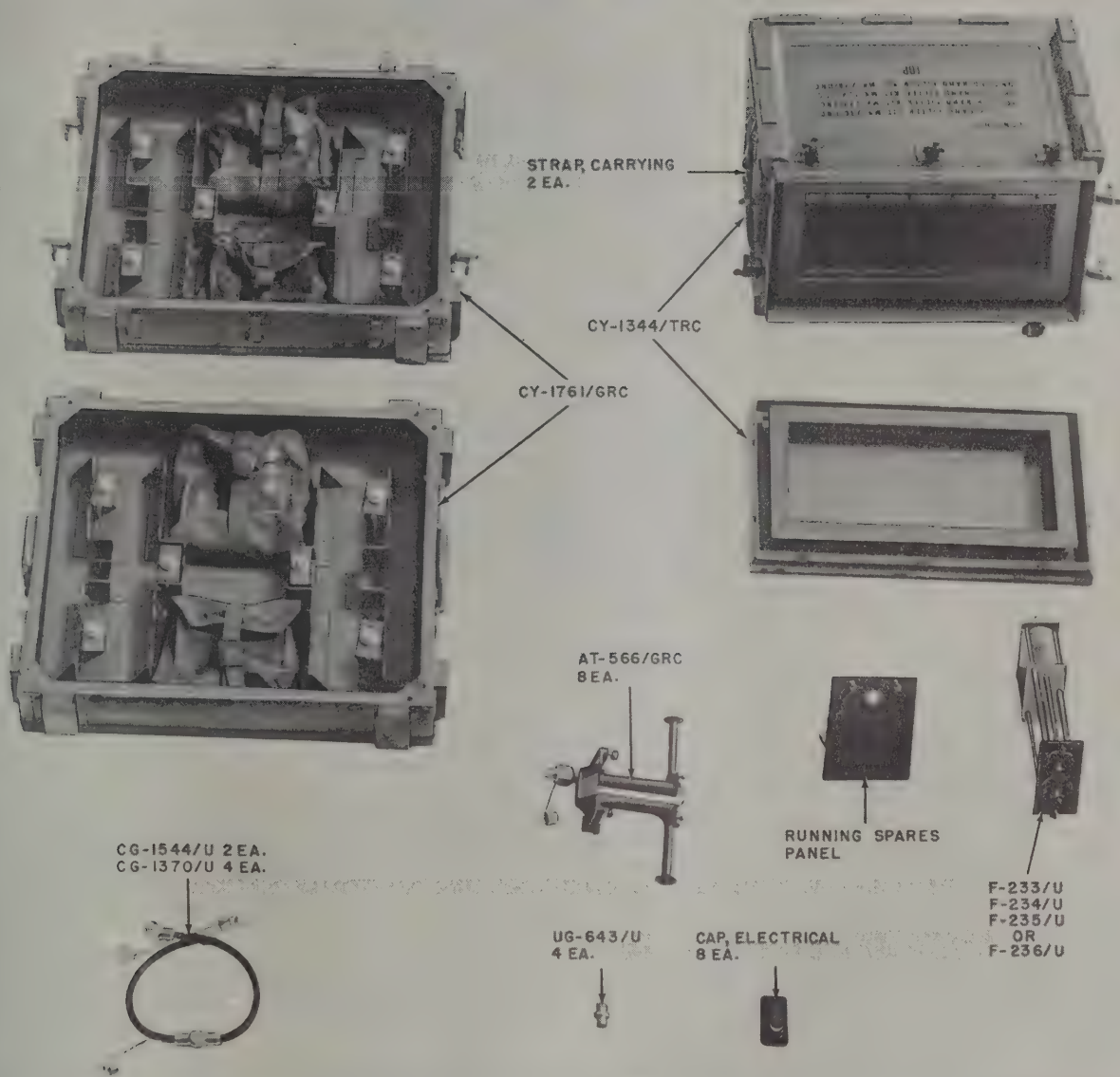


Figure 13. Amplifier Group OA-1596/GRC.



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Figure 14. Antenna Filler Group OA-1397/GRC.

(2) *Radio terminal set.*

Nomenclature	Quantity	Components	Fig. No.
Radio Terminal Set AN/TRC-35	2	Radio Set Group OA-1387/GRC.....	1
	1	Power Accessories Group OA-1676/GRC.....	2
	1	Generator Set Group OA-1675/GRC.....	3
	1	Antenna Group OA-1389/GRC.....	4
	1	Antenna Accessories Group OA-1398/GRC.....	5
	2	Amplifier Group OA-1392/GRC (B-band).....	6
	1	Antenna-Filter Group OA-1393/GRC (B-band).....	7
	2	Amplifier Group OA-1394/GRC (C-band).....	8
	1	Antenna-Filter Group OA-1395/GRC (C-band).....	9
		<i>Note.</i> Radio Set Group AN/TRA-25 (F-band) is not a component of the AN/TRC-35, but is used with the AN/TRC-35 (par. 71).	10
Radio Terminal Set AN/GRC-76	2	Radio Set Group OA-1387/GRC.....	1
	1	Power Accessories Group OA-1676/GRC.....	2
	1	Generator Set Group OA-1675/GRC.....	3
	1	Antenna Accessories Group OA-1398/GRC.....	5
	2	Amplifier Group OA-1390/GRC (A-band).....	11
	1	Antenna Filter Group OA-1391/GRC (A-band).....	12
Radio Terminal Set AN/GRC-79	2	Radio Set Group OA-1387/GRC.....	1
	1	Power Accessories Group OA-1676/GRC.....	2
	1	Generator Set Group OA-1675/GRC.....	3
	1	Antenna Group OA-1389/GRC.....	4
	1	Antenna Accessories Group OA-1398/GRC.....	5
	2	Amplifier Group OA-1392/GRC (B-band).....	6
	1	Antenna-Filter Group OA-1393/GRC (B-band).....	7
	2	Amplifier Group OA-1396/GRC (D-band).....	13
	1	Antenna Filter Group OA-1397/GRC (D-band).....	14
		<i>Note.</i> Radio Set Group AN/TRA-25 (F-band) is not a component of the AN/GRC-79, but is used with the AN/GRC-79 (par. 71).	10
Radio Terminal Set AN/GRC-82	2	Radio Set Group OA-1387/GRC.....	1
	1	Power Accessories Group OA-1676/GRC.....	2
	1	Generator Set Group OA-1675/GRC.....	3
	1	Antenna Group OA-1389/GRC.....	4
	1	Antenna Accessories Group OA-1398/GRC.....	5
	2	Amplifier Group OA-1394/GRC (C-band).....	8
	1	Antenna-Filter Group OA-1395/GRC (C-band).....	9

(3) *Radio relay set and radio repeater set.*

Nomenclature	Quantity	Components	Fig. No.
Radio Relay Set AN/TRC-36	3	Radio Set Group OA-1387/GRC.....	1
	1	Power Accessories Group OA-1676/GRC.....	2
	1	Generator Set Group OA-1675/GRC.....	3
	2	Antenna Group OA-1389/GRC.....	4
	2	Antenna Accessories Group OA-1398/GRC.....	5
	3	Amplifier Group OA-1392/GRC (B-band).....	6
	2	Antenna-Filter Group OA-1393/GRC (B-band).....	7
	3	Amplifier Group OA-1394/GRC (C-band).....	8
	1	Antenna-Filter Group OA-1395/GRC (C-band).....	9
		<i>Note.</i> Radio Set Group AN/TRA-25 (F-band) is not a component of the AN/TRC-36, but is used with the AN/TRC-36 (par. 71).	10

Nomenclature	Quantity	Components	Fig. No.
Radio Repeater Set AN/GRC-77	3	Radio Set Group OA-1387/GRC.....	1
	1	Power Accessories Group OA-1676/GRC.....	2
	1	Generator Set Group OA-1675/GRC.....	3
	2	Antenna Accessories Group OA-1398/GRC.....	5
	3	Amplifier Group OA-1390/GRC (A-band).....	11
	2	Antenna Filter Group OA-1391/GRC (A-band).....	12
Radio Repeater Set AN/GRC-80	3	Radio Set Group OA-1387/GRC.....	1
	1	Power Accessories Group OA-1676/GRC.....	2
	1	Generator Set Group OA-1675/GRC.....	3
	2	Antenna Group OA-1389/GRC.....	4
	2	Antenna Accessories Group OA-1398/GRC.....	5
	3	Amplifier Group OA-1392/GRC (B-band).....	6
	2	Antenna-Filter Group OA-1393/GRC (B-band).....	7
	3	Amplifier Group OA-1396/GRC (D-band).....	13
	2	Antenna Filter Group OA-1397/GRC (D-band).....	14
		<i>Note.</i> Radio Set Group AN/TRA-25 is not a component of the AN/GRC-80, but is used with the AN/GRC-80 (par. 71).	10
Radio Repeater Set AN/GRC-83	3	Radio Set Group OA-1387/GRC.....	1
	1	Power Accessories Group OA-1676/GRC.....	2
	1	Generator Set Group OA-1675/GRC.....	3
	2	Antenna Group OA-1389/GRC.....	4
	2	Antenna Accessories Group OA-1398/GRC.....	5
	3	Amplifier Group OA-1394/GRC (C-band).....	8
	2	Antenna-Filter Group OA-1395/GRC (C-band).....	9

(4) Component summary chart.

Group	Quantity											
	AN/ TRC- 24	AN/ TRC- 35	AN/ TRC- 36	AN/ GRC- 75	AN/ GRC- 76	AN/ GRC- 77	AN/ GRC- 78	AN/ GRC- 79	AN/ GRC- 80	AN/ GRC- 81	AN/ GRC- 82	AN/ GRC- 83
OA-1675/GRC.....	1	1	1	1	1	1	1	1	1	1	1	1
OA-1676/GRC.....	1	1	1	1	1	1	1	1	1	1	1	1
OA-1387/GRC.....	1	2	3	1	2	3	1	2	3	1	2	3
OA-1389/GRC.....	1	1	2				1	1	2	1	1	2
OA-1398/GRC.....	1	1	2	1	1	2	1	1	2	1	1	2
OA-1390/GRC (A-band).....				1	2	3						
OA-1391/GRC (A-band).....				1	1	2						
OA-1392/GRC (B-band).....	1	2	3				1	2	3			
OA-1393/GRC (B-band).....	1	1	2				1	1	2			
OA-1394/GRC (C-band).....	1	2	3							1	2	3
OA-1395/GRC (C-band).....	1	1	1							1	1	2
OA-1396/GRC (D-band).....							1	2	3			
OA-1397/GRC (D-band).....							1	2	3			
AN/TRA-25 ^a (F-band).....	1	2	3				1	2	3			

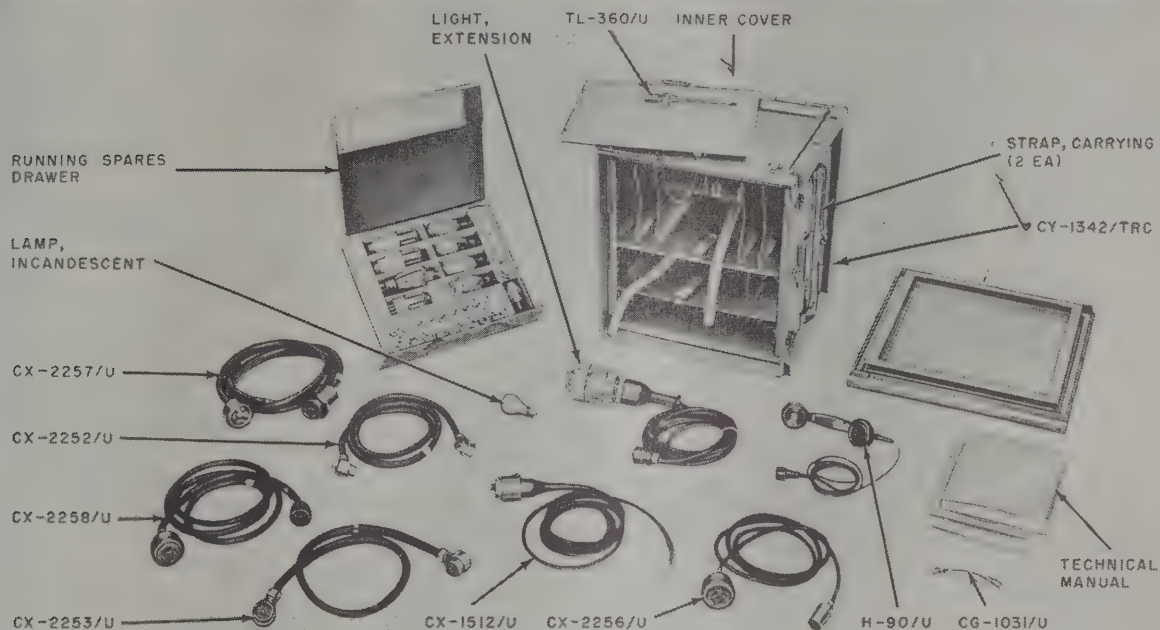
^a Radio Set Group AN/TRA-25 is not a component of the equipments listed above, but is used with these equipments (par. 71).

b. Items of Component Groups.

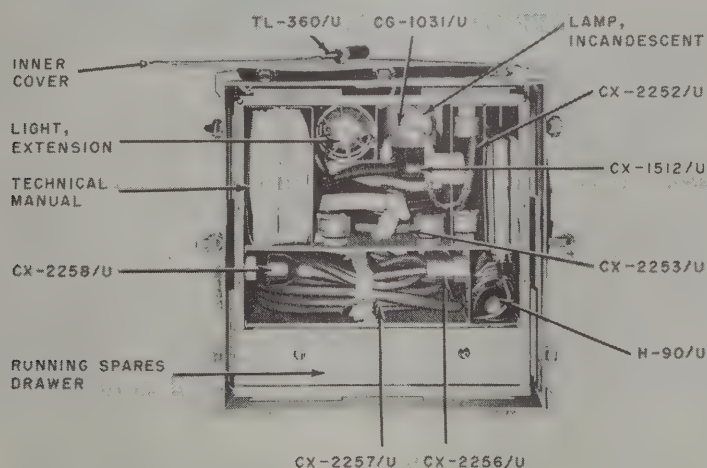
(1) Radio Set Group OA-1387/GRC.

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
1	Power Supply PP-685/TRC including: 1 ea Case, Power Supply CY-1340/TRC-----	1	17½	18¾	20⅝	115
	or					
1	Power Supply PP-685A/TRC including: 1 ea Case, Power Supply CY-1340/TRC-----	1	17½	18¾	20⅝	115
1	Receiver, Radio R-417/TRC including: 1 ea Case, Receiver CY-1339/TRC-----	1	17⅞	18¼	20⅝	96½
	1 ea filter, dummy-----	1				
	or					
1	Receiver, Radio R-417A/TRC including: 1 ea Case, Receiver CY-1339/TRC-----	1	17⅞	18¼	20⅝	96½
	1 ea filter, dummy-----	1				
1	Transformer, Power, Fixed Auto Transformer TF-167/TRC-----	1				
1	Transmitter, Radio T-302/TRC including: 1 ea Case, Trnasmmitter CY-1341/TRC-----	1	18½	22	20⅝	120¾
	1 ea filter, dummy-----	1				
	or					
1	Transmitter, Radio T-302A/TRC including: 1 ea Case, Transmitter CY-1341/TRC-----	1	18½	22	20⅝	120¾
	1 ea filter, dummy-----	1				
1	Accessory Kit MK-133/TRC including:	1 and 15				
	1 ea Case, Accessor- es CY-1342/TRC-----	15	18⅝	20⅝	21½	94
	1 ea Cable Assembly, Power Electrical CX-2253/U (4 ft)-----	15				
	1 ea Cable Assembly, Power Electrical CX-2256/U (8 ft)-----	15				
	1 ea Cable Assembly, Power Electrical CX-2257/U (10 ft)-----	15				
	1 ea Cable Assembly, Power Electrical CX-2258/U (8 ft)-----	15				
	1 ea Cable Assembly, Radio Frequency CG-1031/U-----	15				
	1 ea Cable Assembly, Special Purpose, Electrical CX-2252/U (6 ft.)-----	15				
	1 ea Cable Assembly, Telephone CX-1512/U (12 ft)-----	15				
1	1 ea running spares drawer containing:	15 and 16				
	1 ea capacitor, fixed 0.1 UF ±5% 200 vdcw-----	16				
	1 ea crystal rectifying unit 1N21B-----	16				
	1 ea crystal rectifying unit 1N69A-----	16				
	1 ea electron tube OA3-----	16				
	3 ea electron tube 4X150A-----	16				
	2 ea electron tube 4X150G-----	16				
	2 ea electron tube 5R4WGB-----	16				
	2 ea electron tube 6AN5-----	16				
	1 ea electron tube 6AV6-----	16				
	3 ea electron tube 6CB6-----	16				
	3 ea electron tube 6J4-----	16				
	1 ea electron tube 836-----	16				
	3 ea electron tube 5654/6AK5W-----	16				
	3 ea electron tube 5670-----	16				
	1 ea electron tube 5725/6AS6W-----	16				
	1 ea electron tube 5726/6AL5W-----	16				
	2 ea electron tube 5751-----	16				
	1 ea electron tube 5933-----	16				
	4 ea electron tube 5998-----	16				
	8 ea fuse ½ amp, 250v-----	16				
	8 ea fuse 1 amp, 250v-----	16				
	6 ea fuse 3 amp, 250v-----	16				
	6 ea fuse 5 amp, 250v-----	16				
	6 ea fuse 10 amp, 250v-----	16				
	3 ea incandescent lamp 0.15 amp, 6.3v, 1w-----	16				
	8 ea fuse 20 amp, 250v-----	16				
	1 ea resistor, fixed 130 ohms, 2w-----	16				

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
1 ea	Handset H-90/U	15				
1 ea	lamp, incandescent 0.417 ampere, 120 volts, 50 watts	15				
1 ea	light, extension with incandescent lamp, 120v, 60w	15				
1 ea	Screwdriver TL-360/U	15				
2 ea	strap, carrying					
2 ea	technical manual					



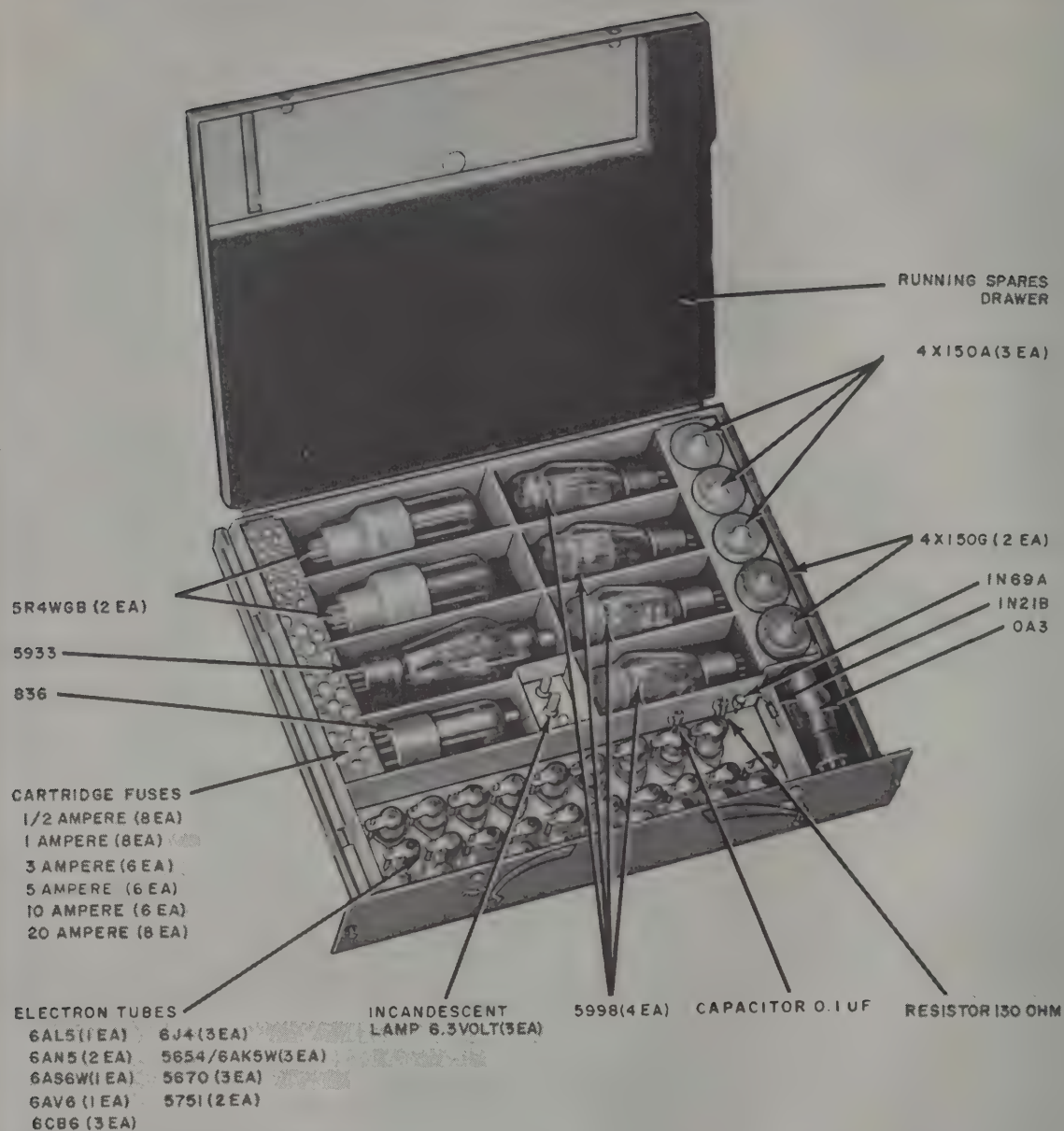
A. COMPONENTS REMOVED FROM CASE, ACCESSORIES CY-1342/TRC



B. COMPONENTS INSTALLED IN CASE, ACCESSORIES CY-1342/TRC

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Figure 15. Accessory Kit MK-183/TRC.



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Figure 16. Running spares drawer of Accessory Kit MK-133/TRC.

(2) *Generator Set Group OA-1675/GRC.*

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
1	Cable Assembly, Power Electrical CX-2251/U (150 ft)-----	3				
2	Cable Assembly, Power Electrical CX-2254/U (10 ft)-----	3				
5	Drums, gasoline (5 gal.)-----	3				
1	Spout, gasoline, flexible-----	3				
1	Generator Set, Gasoline Engine PU-286/G-----	2				
1	Ground Rod MX-148/G-----	3				
1	Reel, Cable RC-405/TR-----	3				

(3) *Power Accessories Group OA-1676/GRC.*

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
1	Case, Accessories CY-1343/TRC containing:	2	18 $\frac{5}{8}$	20 $\frac{5}{8}$	21 $\frac{1}{2}$	140
	1 ea Cable Assembly, Radio Frequency CG-718A/U-----	2				
	2 ea Cable Assembly, Special Purpose, Electrical CX-2406/U (30 in.).	2				
	1 ea Cable Assembly, Special Purpose, Electrical CX-2420/U (36 in.).	2				
	1 ea Cable Assembly, Special Purpose, Electrical CX-2473/U (30 in.).	2				
	2 ea Cable Assembly, Radio Frequency CG-789A/U-----	2				
	1 ea Cable Assembly, Radio Frequency CG-1091/U (30 in.)-----	2				
	1 ea Cable Assembly, Radio Frequency CG-1103/U (30 in.)-----	2				
	2 ea strap, carrying-----	2				
	1 ea Interconnecting Box J-532/U-----	2				
	1 ea Screwdriver TL-358/U-----	2				
	1 ea Switch Box SA-331/U-----	2				
	1 ea Wattmeter ME-82/U-----	2				

(5) *Antenna Accessories Group OA-1398/GRC.*

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
1	Case, Accessories CY-1392/G-----	5	11 $\frac{1}{8}$	17 $\frac{1}{4}$	19 $\frac{7}{8}$	126
1	Block and tackle-----	5				
2	Cable Assembly, Radio Frequency CG-1030/U (80 ft)-----	5				
6	Reel, cable-----	5				
4	Clamp, electrical-----	5				
2	Rope, guy-----	5				
1	Carrying case, guy stake-----	5				
1	Hammer HM-3-----	5				
2	Insulation Tape, Electrical TL-83-----	5				
2	Insulation, Tape, Electrical TL-192-----	5				
3	Case, mast-----	5				
1	Cap, gin pole-----	5				
3	Plate, guy-----	5				
5	Clamp, guy stake-----	5				
4	Guy MX-1483/G, (50 ft)-----	5				
4	Guy MX-1483/G, (58 ft)-----	5				
4	Guy MX-1484/G, (70 ft)-----	5				

(4) *Antenna Group OA-1389/GRC.*

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
1	Case, Antenna Reflector CY-1385/TRC.....	4	12½	33⅝	51¾	132
1	Case, Antenna Reflector Support CY-1387/TRC.....	4	6½	30	33⅝	70
1	Cradle, antenna mast.....	4				
4	Shackle, anchor.....	4				
2	Reel, cable.....	4				
2	Shackle, chain.....	4				
4	Clamp, electrical.....	4				
1	Wrench, open end, fixed (⅞ in.).....	4				
4	Guy MK-1483/G (75 ft).....	4				
2	Reflector, Antenna AT-414/TRC.....	4				
1	Handle socket wrench.....	4				
1	Socket, wrench, common (½ in.).....	4				
1	Support, Antenna Reflector AB-325/TRC.....	4				
1	Wrench, box.....	4				

(6) *Antenna Accessories Group OA-1398/GRC.*

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
1	Base, mast.....	5				
14	Mast Section AB-332/G.....	5				
5	Stake, Guy GP-113/G.....	5				
1	Reel, Cable RC-404/TR.....	5				
12	Strap, retaining.....	5				
4	Stake, Ground GP-2.....	5				

(7) *Amplifier Group OA-1390/GRC (A-band).*

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
1	Case, Standardized Component, Electrical CY-1338/TRC.....	11	18⅜	17⅞	20⅝	39
1	Amplifier-Converter AM-1179/GRC.....	11				
1	Amplifier, Radio Frequency AM-1180/GRC.....	11				

(8) *Amplifier Group OA-192/GRC (B-band).*

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
1	Case, Standard Components CY-1338/TRC.....	6	18⅜	17⅞	20⅝	39
1	Amplifier-Converter AM-913/TRC.....	6				
1	Amplifier, Radio Frequency AM-912/TRC.....	6	6⅜	15⅝	11⅝	
	or					
1	Amplifier, Radio Frequency AM-912/TRC.....	-----	6⅜	15⅝	11⅝	

(9) *Amplifier Group OA-1394/GRC (C-band).*

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
1	Case, Standard Components CY-1338/TRC-----	8	18 $\frac{3}{8}$	17 $\frac{1}{8}$	20 $\frac{5}{8}$	39
1	Amplifier-Converter AM-914/TRC-----	8	6 $\frac{3}{8}$	11	7 $\frac{3}{16}$	
1	Amplifier-Multiplier, Radio Frequency AM-915/TRC-----	8	6 $\frac{3}{16}$	15 $\frac{5}{16}$	11 $\frac{5}{16}$	
	or					
1	Amplifier-Multiplier, Radio Frequency AM-915A/TRC-----	-----	6 $\frac{3}{16}$	15 $\frac{5}{16}$	11 $\frac{5}{16}$	

(10) *Amplifier Group OA-1396/GRC (D-band).*

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
1	Case, Standardized Components, Electrical CY-1338/TRC-----	13	18 $\frac{3}{8}$	17 $\frac{1}{8}$	20 $\frac{5}{8}$	39
1	Amplifier-Converter AM-1177/GRC-----	13				
1	Amplifier-Multiplier Radio Frequency AM-1178/GRC-----	13				

(11) *Antenna Filter Group OA-1391/GRC (A-band).*

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
1	Case, Antenna CY-1760/GRC-----	12	10	19 $\frac{1}{2}$	77 $\frac{1}{2}$	160
1	Antenna AS-756/GRC consisting of:					
	12 ea antenna elements (long)-----	12				
	12 ea antenna elements (short)-----	12				
	12 ea antenna subassembly-----	12				
	2 ea antenna boom-----	12				
	1 ea array spacer bar-----	12				
	2 ea clamp, electrical-----	12				
	2 ea connector, adapter UG-643/U-----	12				
	1 ea mast head casting-----	12				
	1 ea wrench, open end ($\frac{7}{8}$ in.)-----	12				
	1 ea wrench, spin type ($\frac{7}{16}$ in.)-----	12				
	1 ea antenna mast stand-----	12				
1	Filter Kit MK-236/GRC consisting of:					
	1 ea Case, Accessories CY-1344/TRC-----	12				
	1 ea Filter, Band Pass F-238/U-----	12				
	1 ea Filter, Band Pass F-239/U-----	12				
	1 ea Filter, Band Pass F-240/U-----	12				
	1 ea Filter, Band Pass F-241/U-----	12				
	1 ea Filter, Band Pass F-242/U-----	12				
	1 ea Filter, Band Pass F-243/U-----	12				

(12) *Antenna-Filter Group OA-1393/GRC (B-band).*

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
1	Case, Antenna CY-1371/TRC.....	7	9½	17	29	92
1	Antenna AS-639/TRC consisting of:					
	4 ea Antenna Dipole AT-412/TRC.....	7				
	2 ea Connector, Adapter UG-643/U.....	7				
	2 ea Cable Assembly, Radio Frequency CG-1042/U (40 in.)....	7				
1	Filter Kit MK-123/TRC consisting of:					
	1 ea Case, Accessories CY-1344/TRC.....	7	12¼	18¼	20¾	70
	1 ea Filter, Band Pass F-192/U.....	7				
	1 ea Filter, Band Pass F-193/U.....	7				
	1 ea Filter, Band Pass F-194/U.....	7				
	1 ea Filter, Band Pass F-195/U.....	7				
	1 ea Filter, Band Pass F-196/U.....	7				
	1 ea Filter, Band Pass F-197/U.....	7				
	2 ea strap, carrying.....	7				

(13) *Antenna-Filter Group OA-1395/GRC (C-band).*

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
1	Case, Antenna CY-1370/TRC.....	9	9½	21¾	24¾	66
1	Antenna AS-640/TRC consisting of:					
	4 ea Antenna Dipole, AT-413/TRC.....	9				
	2 ea Cable Assembly, Radio Frequency CG-1042/U (40 in.)....	9				
	2 ea Connector, Adapter UG-643/U.....	9				
1	Filter Kit MK-124/TRC consisting of:					
	1 ea Case, Accessories CY-1344/TRC.....	9	12¼	18¼	20¾	70
	1 ea Filter Band Pass F-199/U.....	9				
	1 ea Filter Band Pass F-200/U.....	9				
	1 ea Filter Band Pass F-201/U.....	9				
	1 ea Filter Band Pass F-202/U.....	9				
	1 ea Filter Band Pass F-203/U.....	9				
	1 ea Filter Band Pass F-204/U.....	9				
	2 ea strip, carrying.....	9				

(14) *Antenna Filter Group OA-1397/GRC (D-band).*

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
1	Case, Antenna CY-1761/GRC.....	14	10	20	25½	92
4	Adapter, Connector UG-643/U.....	14				
1	Antenna AS-655/GRC consisting of:					
	8 ea Antenna Element AT-566/GRC.....	14				
	2 ea Cable Assembly, Radio Frequency GC-1544/U (26 in.)....	14				
	4 ea Cable Assembly, Radio Frequency GC-1370/U (40 in.)....	14				
	8 ea cap, electrical.....	14				
1	Filter Kit MK-228/GRC consisting of:					
	1 ea Case, Accessories CY-1344/TRC.....	14	12¼	18¼	20¾	60
	1 ea Filter, Band pass F-233/U.....	14				

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
	1 ea Filter, Band Pass F-234/U-----	14				
	1 ea Filter, Band Pass F-235/U-----	14				
	1 ea Filter, Band Pass F-236/U-----	14				
	1 ea running spares panel-----	14				
	2 ea strap, carrying-----	14				

(15) *Radio Set Group AN/TRA-25 (F-band).*

Quantity	Item	Figure No.	Dimensions (in.)			Unit weight (lb)
			Height	Depth	Width	
1	Case, Amplifier and Mixer Stage CY-2854/TRA-25 containing:	10	18 $\frac{3}{8}$	17 $\frac{1}{2}$	20 $\frac{5}{8}$	22
	1 ea Mixer Stage, Frequency CV-932/TRA-25-----	10	2 $\frac{1}{2}$	6 $\frac{1}{8}$	11 $\frac{1}{2}$	7
	1 ea Oscillator-Multiplier O-734/TRA-25*-----	10				
	1 ea Oscillator-Multiplier O-735/TRA-25*-----	10				
	1 ea Amplifier-Converter AM-2537/TRA-25 containing:*	10	6 $\frac{3}{16}$	15 $\frac{5}{16}$	11 $\frac{15}{16}$	25
	1 ea Cable Assembly, Radio Frequency CG-1887/U-----	10		9		
	1 ea Cable Assembly, Radio Frequency CG-1888/U-----	10		12		
	1 ea tube puller-----	10				
	1 ea wrench, Allen, No. 6-----	10				
	1 ea wrench, multiple spline, No. 4-----	10				
	1 ea wrench, multiple spline (modified) No. 4-----	10				
	1 ea wrench, multiple spline (modified) No. 6-----	10				
	1 ea cable adapter-----	10				
	1 ea Cable Assembly, Special Purpose Electrical CX-6128/U (68 in.).	10		65		
2	Case, Antenna CY-2853/TRA-25 containing:	10	12	34	34	
	1 ea Antenna Assembly AN-1083/TRA-25 including:					
	2 ea Antenna AS-1082/TRA-25-----	10				
	2 ea Cable Assembly, Radio Frequency CG-1889/U-----	10				
	1 ea Mount Assembly-----	10				
	1 ea Cable Assembly, Radio Frequency CG-1886/U (80 ft)-----	10				
	1 ea Cable Assembly, Radio Frequency CG-1890/U (51 in.)-----	10				

*O-734/TRA-25 or O-735/TRA-25 is contained within AM-2537/TRA-25 for shipment.

c. Running Spares.

Nomenclature	Quantity	Components	Fig. No.
Power Supply PP-685/TRC----- or Power Supply PP-685A/TRC	1	Thermal relay-----	17
Generator Set Group OA-1675/GRC	5	Drum, gasoline (gal.)-----	3
	1	Generator Set, Gasoline Engine PU-286/G-----	3
	1	Ground Rod MK-148/G-----	3
	1	Spout, gasoline, flexible-----	3
Power Accessories Group OA-1676/GRC.	12	Catridge fuse, 10 amp 250v for J-532/U-----	16
	2	Crystal rectifying unit 1N21B for ME-82/U-----	16
Antenna Group OA-1389/GRC-----	2	Clamp, electrical-----	4
Antenna Accessories Group OA-1398/GRC.	2	Cable Assembly, Radio Frequency CG-1030/U, (80 ft)-----	5
	3	Hammer handle, 32 in length, for HM-3-----	5
	1	Reel, Cable RC-404/TR-----	5

Nomenclature	Quantity	Components	Fig. No.
Amplifier Group OA-1390/GRC (A-band).	1	Reel, cable	5
	1	Guy MX-1484/G (70 ft)	5
	2	Plate, guy	5
	1	Mast Section AB-332/G	5
	1	Electron tube 6J4	16
Antenna Filter Group OA-1391/ GRC (A-band).	1	Electron tube 5670	16
	1	Electron tube 5654/6AK5W	16
	1	Electron tube 4X150A for AM-1180/GRC	16
	6	Antenna elements (long) for AS-756/GRC	12
	6	Antenna elements (short) for AS-756/GRC	12
Amplifier Group OA-1392/GRC (B-band)	6	Antenna subassembly for AS-756/GRC	12
	1	Electron tube 4X150A for AM-912/TRC or AM-912/TRC	16
	1	Electron tube 5670 for AM-913/TRC	16
	1	Electron tube 6J4 for AM-913/TRC	16
Antenna-Filter Group OA-1393/ GRC (B-band).	2	Antenna Dipole AT-412/TRC for AS-639/TRC	7
Amplifier Group OA-1394/GRC (C-band).	1	Electron tube 5670 for AM-914/TRC	16
	2	Electron tube 6J4 for AM-914/TRC	16
	1	Electron tube 4X150A for AM-91500/TRC	16
	1	Electron tube 4X150G for AM-915(*)/TRC	16
Antenna-Filter Group OA-1395/ GRC (C-band).	2	Antenna Dipole AT-413/TRC for AS-640/TRC	9
	1	Electron tube 5768 for AM-1177/GRC	17
	1	Electron tube 6AF4A for AM-1177/GRC	17
	1	Electron tube 6AN4 for AM-1177/GRC	17
Amplifier Group OA-1396/GRC (D-band).	1	Crystal rectifier 1N457 for AM-1178/GRC	17
	1	Electron tube 4X150A for AM-1178/GRC	16
	1	Electron tube 4X150G for AM-1178/GRC	16
	4	Antenna Element AT-566/GRC for AS-755/GRC	14
	2	Cable Assembly, Radio Frequency CG-1544/U for AS-755/GRC	14
	2	Cable Assembly, Radio Frequency CG-1370/U for: AS-755/GRC	14
	4	Cap, electrical for AS-755/GRC	14
	3	Electron tube 5876	18
Antenna-Filter Group OA-1397/ GRC (D-band).	2	Electron tube 6939	18
	2	Electron tube 12AT7WA	18
	1	Electron tube 3CX100A5	18
	5	Cartridge fuse, 3/10 ampere	18
	1	Antenna AS-1083/TRA-25	10
	1	Crystal CR-51/U (38.347220 mc)	18
	1	Crystal CR-51/U (41.412500 mc)	18
	1	Crystal 1N21ER	18
Radio Set Group AN/TRA-25			

6. Description

The radio equipment sets covered in this manual (par. 1) consists of a specified quantity of separately packaged components (par. 5). Transit cases used to house some of these components are similar. Other cases differ as required for their particular use. The components used to form the various sets are shown in figures 1 through 15. When a set is arranged for operation, the transit cases containing the components may be stacked as convenient for

the particular application. In some applications, some components of the set may be removed from the cases and installed in specially fabricated mountings.

7. Application

A radio section (par. 3) includes two radio terminals and may or may not include one or more radio repeaters. Many factors determine the range between terminals and repeaters. The nature of

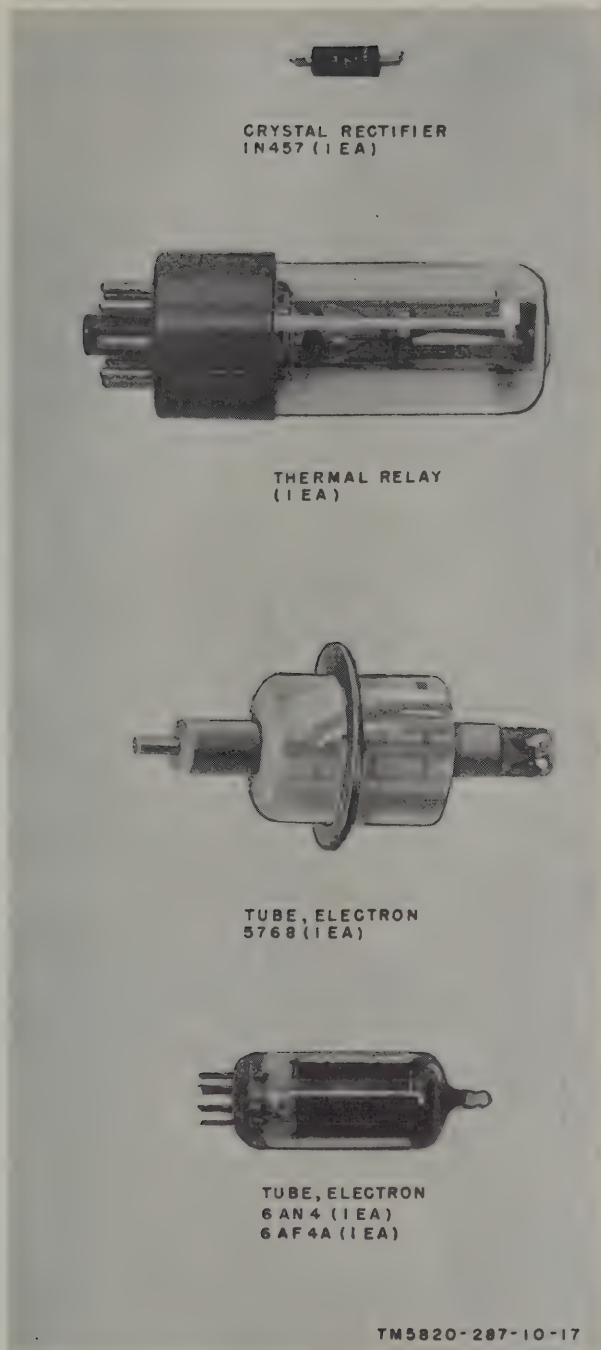


Figure 17. Thermal relay, crystal rectifier 1N457, and electron tubes 5768 and 6AF4A.

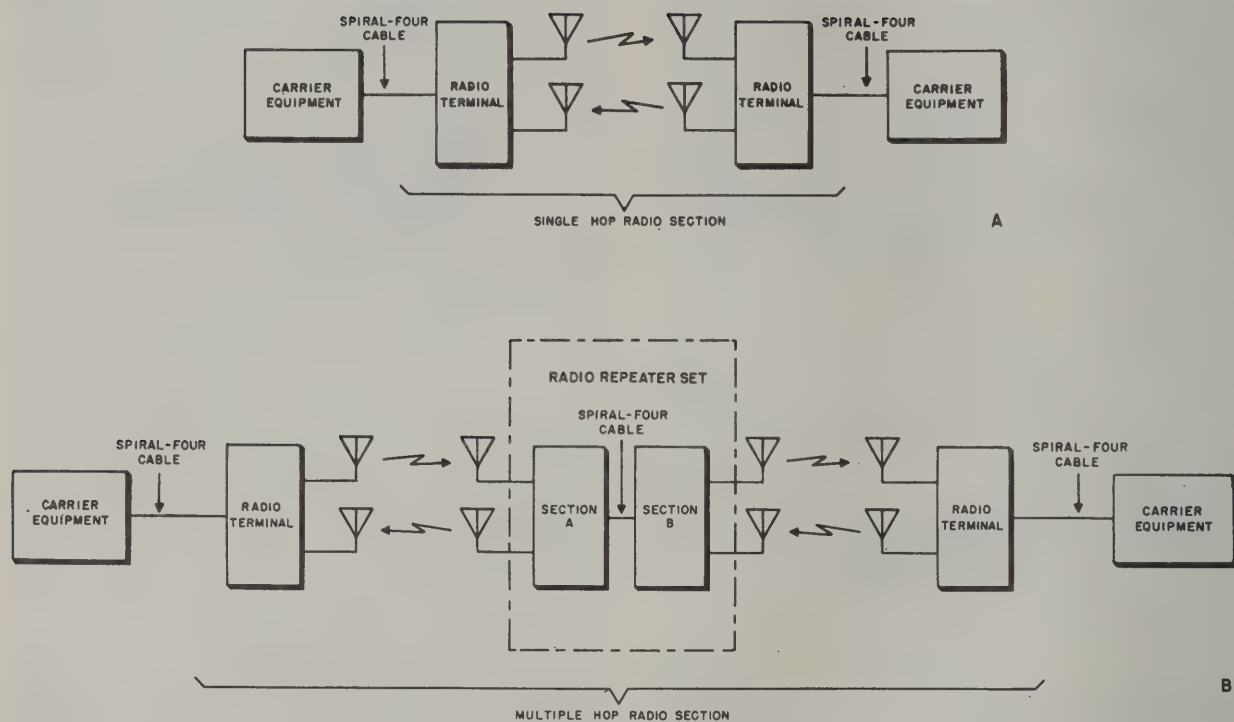
the terrain, the frequency band employed, the height of the antennas, and the atmospheric conditions are some of the factors. Information on radio system planning and layout is contained in TM 11-486-6. Under normal conditions, a range of approximately 30 miles between sets can be considered average (A, fig. 19). When the A and B sections of the radio repeater are located more than



Figure 18. Radio Set Group AN/TRA-25 running spares less antenna AS-1083/TRA-25.

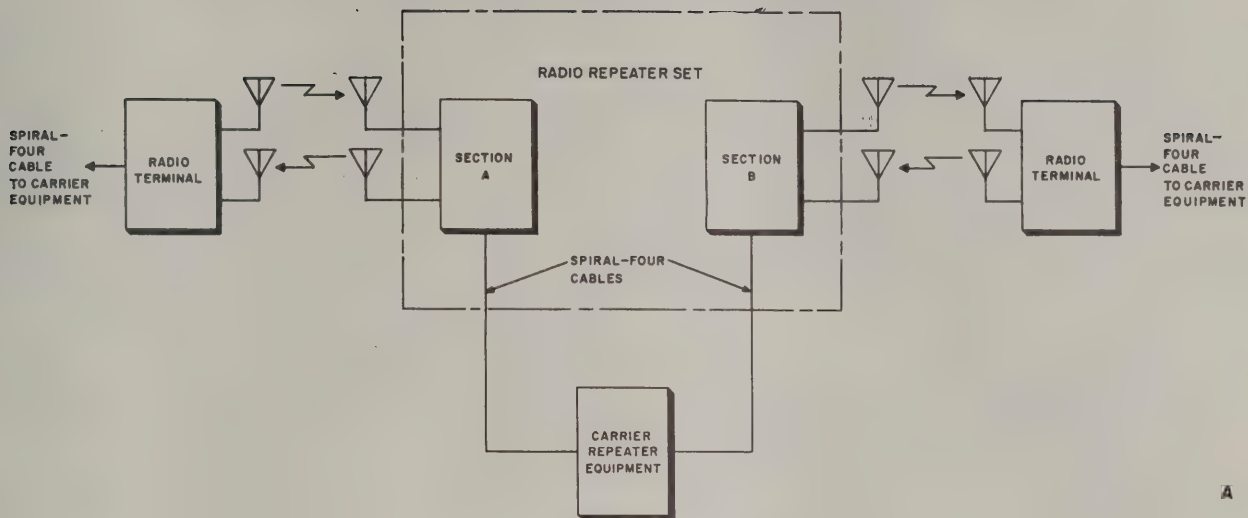
a mile apart, carrier repeaters (A, fig. 20) must be used to overcome possible excessive signal attenuation. When it is necessary to use a radio repeater as

a dropoff, carrier terminals (B, fig. 20) must be located between the two sections of the radio repeater.

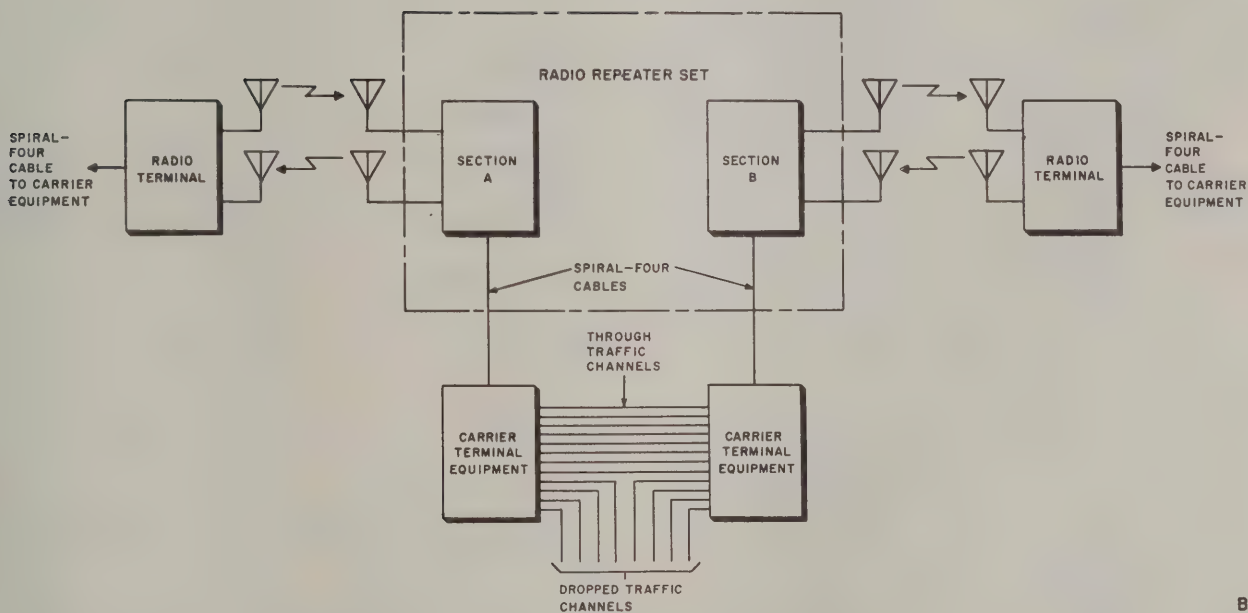


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Figure 19. Typical radio section application in carrier system.



A



B

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Figure 20. Typical radio section applications in carrier system with carrier equipment between radio repeater sets.

CHAPTER 2

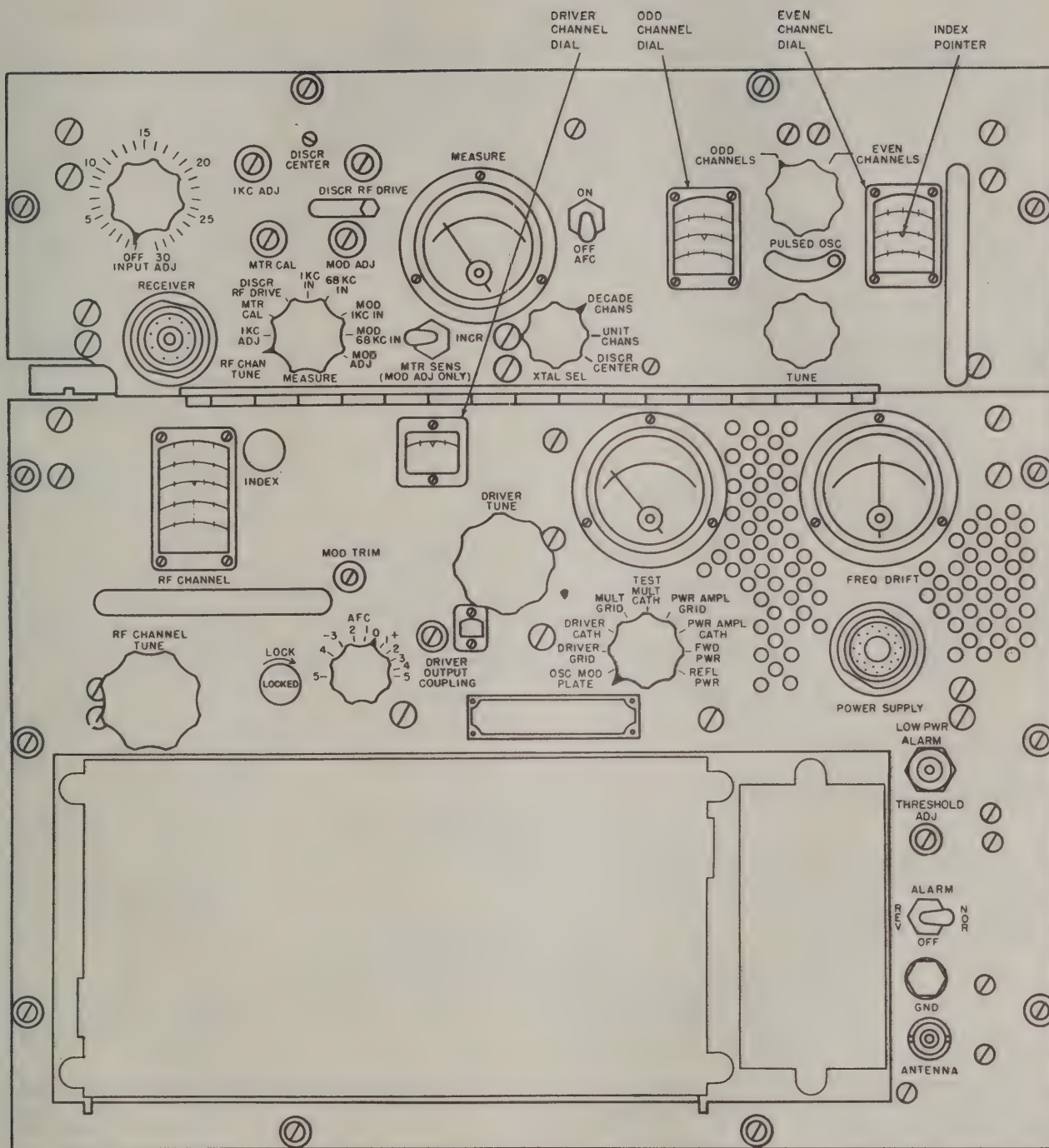
CONTROLS AND INDICATORS

Section I. TRANSMITTER, RECEIVER, AND POWER EQUIPMENT

8. Transmitter, Radio T-302(*)/TRC (fig. 21)

Control or indicator	Function
INPUT ADJ control.....	Controls level of incoming signal to transmitter.
MEASURE meter.....	Indicates level of each signal selected by MEASURE switch.
MEASURE switch	
<i>Switch position</i>	<i>Circuit connected</i>
RF CHAN TUNE.....	RF channel signal.
1 KC ADJ.....	1 kc oscillator signal.
MTR CAL.....	1 kc oscillator signal from calibration circuit.
DISCR RF DRIVE.....	RF channel signal from discriminator.
1 KC IN.....	1 kc test signal from carrier equipment.
68 KC IN.....	68 kc test signal from carrier equipment.
MOD 1 KC IN.....	1 kc carrier equipment test signal from discriminator.
MOD 68 KC IN.....	68 kc carrier equipment test signal from discriminator.
MOD ADJ.....	1 kc oscillator signal from discriminator.
MTR SENS switch.....	When operated to INCR position, increases sensitivity of MEASURE meter circuit when MEASURE switch is in MOD ADJ position.
AFC switch	
<i>Position</i>	<i>Action</i>
ON.....	Applies power to automatic frequency control system.
OFF.....	Disconnects power from automatic frequency control system.
PULSED OSC switch	
<i>Position</i>	<i>Action</i>
ODD CHANNELS.....	Connects odd channel dial to indicate RF channel number.
EVEN CHANNELS.....	Connects even channel dial to indicate RF channel number.
Odd channel dial.....	Indicates RF channel number when PULSED OSC switch is in ODD CHANNELS.

Control or indicator	Function
Even channel dial.....	Indicates RF channel number when PULSED OSC switch is in EVEN CHANNELS.
XTAL SEL switch.....	Connects indicated valve crystal in crystal oscillator
<i>Switch position</i>	<i>Crystal connected</i>
DECADE CHANS.....	2.5 mc.
UNIT CHANS.....	1 mc.
DISCR CENTER.....	10.125 mc.
1 KC ADJ control.....	Adjusts level of 1-kc oscillator signal.
MTR CAL control.....	Adjusts calibration circuit to 1-kc oscillator signal.
DISCR RF DRIVE control ..	Adjust level of RF channel signal from discriminator.
MOD ADJ control.....	Adjusts level of 1-kc oscillator from discriminator.
DISCR CENTER control.....	Adjusts discriminator to RF-channel signal frequency.
TUNE control.....	Adjusts frequency of pulsed oscillator.
RF CHANNEL TUNE control.	Adjusts frequency of base RF oscillator.
RF CHANNEL dial.....	Indicates desired RF channel number.
INDEX control.....	Adjusts index line of RF CHANNEL dial.
MOD TRIM control.....	Adjusts reactance modulator to RF channel frequency.
LOCK control.....	Secures RF CHANNEL TUNE control in fixed position.
AFC control.....	Permits manual correction of automatic frequency control system.
DRIVER OUTPUT COUPLING control.	Adjusts coupling between driver and RF tuners.
DRIVER TUNE control.....	Adjusts RF channel frequency.
DRIVER CHANNEL dial.....	Indicates desired RF channel number for A-band on white scale, and in B-, C-, D-, and F-bands on black scale.
TEST meter.....	Indicates magnitude of current for each circuit selected by TEST switch.
TEST switch.....	Connects TEST meter to circuits indicated.



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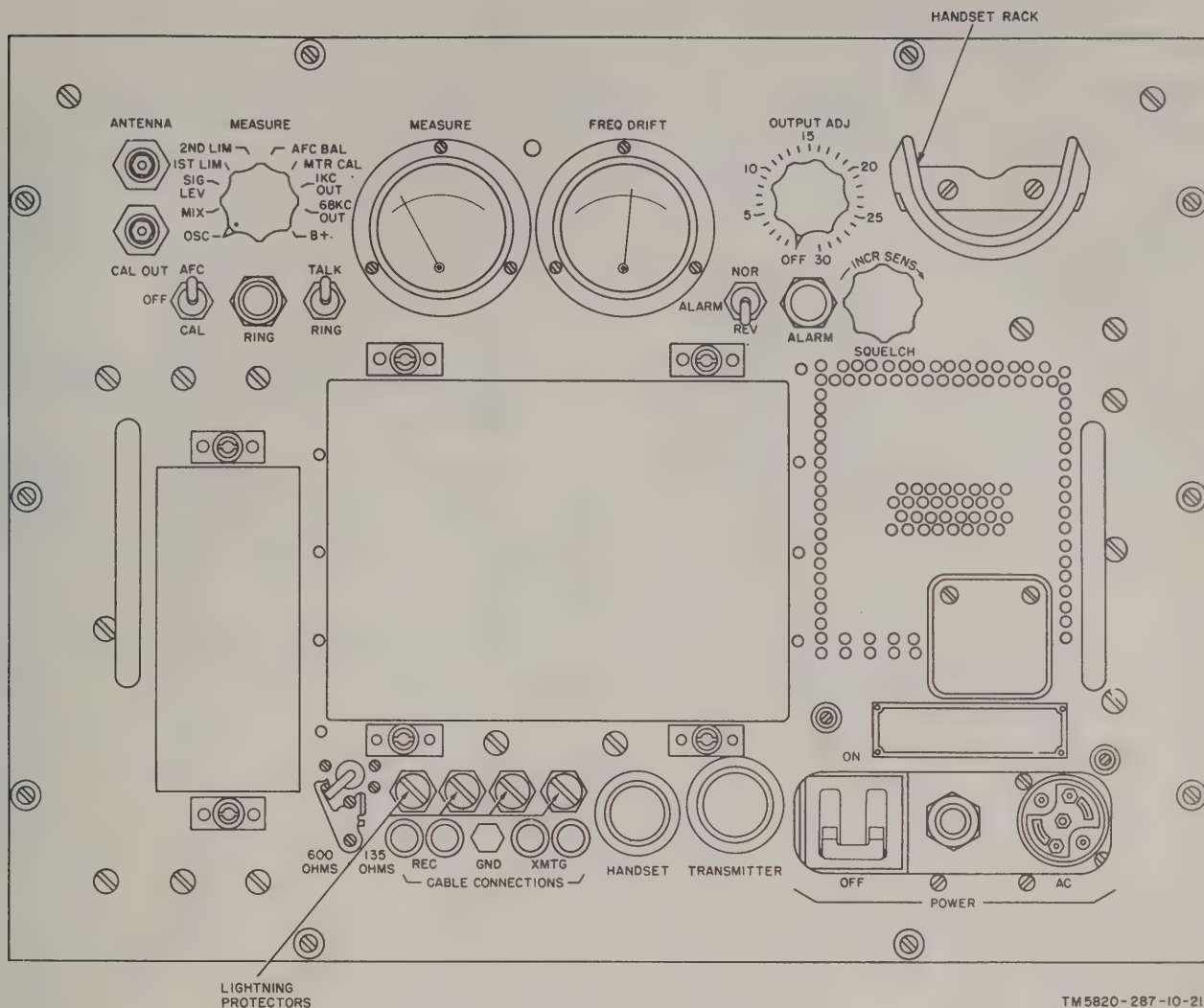
Figure 21. Transmitter, Radio T-302/TRC, front panel.

Control or indicator	Function
<i>Switch position</i> OSC MOD PLATE-----	<i>Circuit connected</i> Base RF oscillator and reactance modulator plate circuits.
DRIVER GRID-----	Driver grid circuit.
DRIVER CATH-----	Driver cathode circuit.
MULT GRID-----	Multiplier grid circuit.
MULT CATH-----	Multiplier cathode circuit.
PWR AMPL GRID-----	Power amplifier grid circuit.
PWR AMPL CATH-----	Power amplifier cathode circuit.
FWD PWR-----	Forward power portion of directional coupler.
REFL PWR-----	Reflected power portion of directional coupler.
FREQ DRIFT meter-----	Indicates magnitude of discriminator output signal.
LOW PWR ALARM indicator (red).	Indicates when RF output is too low.
THRESHOLD ADJ control--	Adjusts reference level for LOW PWR ALARM indicator.
ALARM switch	
<i>Position</i> REV-----	<i>Action</i> Connects buzzer to alarm amplifier to indicate an RF output above reference level.
OFF-----	Disconnects buzzer from alarm amplifier.
NOR-----	Connects buzzer to alarm amplifier to indicate an RF output below reference level.

9. Receiver, Radio R-417(*)/TRC (fig. 22)

Control or indicator	Function
POWER circuit breaker-----	
<i>Position</i> ON-----	<i>Action</i> Applies power to equipment and protects equipment from overload.
OFF-----	Removes power from equipment.
POWER indicator (amber)---	Indicates when power is applied to equipment.
AFC-OFF-CAL switch	
<i>Switch position</i> AFC-----	<i>Action</i> Connects power to automatic frequency control motor in amplifier-converter.

Control or indicator	Function
OFF-----	Disconnects automatic frequency control circuit and calibration oscillator circuit.
CAL-----	Connects power to calibration oscillator circuit.
RING-TALK switch	
<i>Switch position</i> RING-----	<i>Action</i> Applies power to 1,600-cps oscillator.
TALK-----	Applies power to order-wire circuits.
RING lamp (white)-----	Indicates when ringing signal is received or transmitted, and when power fails.
MEASURE meter-----	Indicates level of each signal selected by MEASURE switch.
MEASURE switch-----	Connects MEASURE meter to circuit indicated.
<i>Switch position</i> OSC-----	<i>Circuit connected</i> Grid circuit of oscillator in amplifier-converter.
MIX-----	Grid circuit of mixer in amplifier-converter.
SIG LEV-----	Automatic gain control circuit.
1ST LIM-----	Grid circuit of 1st limiter.
2ND LIM-----	Grid circuit of 2d limiter.
AFC BAL-----	Automatic frequency control circuit.
MTR CAL-----	1 kc from meter amplifier.
1 KC OUT-----	1-kc output from 3d base band amplifier.
68 KC OUT-----	68-kc output from 3d base band amplifier.
B+-----	B+ circuit of power supply.
FREQ DRIFT meter-----	Indicates level of discriminator output.
OUTPUT ADJ control-----	Adjusts input signal to base band amplifier and order-wire circuits.
ALARM switch	
<i>Switch position</i> NOR-----	<i>Action</i> Connects buzzer across alarm circuit to operate when input signal is below reference level.
REV-----	Connects buzzer across alarm circuit to operate when input signal is above reference level.
ALARM lamp (red)-----	Indicates when input signal is below reference level.
SQUELCH control-----	Eliminates weak signals and noise from output and sets reference level for alarm circuit.



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Figure 22. Receiver, Radio R-417/TRC, front panel.

Control or indicator	Function
600 OHMS—135 OHMS switch.	Selects receiver output impedance to match impedance of 600 ohms or 135 ohms load.

10. Power Supply PP-685(*)/TRC (fig. 23)

Control or indicator	Function
115V AC circuit breaker Position ON	Action Connects power to equipment and protects from overloads.

Control or indicator	Function
OFF 150V DC circuit breaker Switch Position ON	Action Disconnects power from equipment. Connects 150 v dc to TRANSMITTER connector and protects equipment from overloads.
OFF 750V DC circuit breaker Switch Position ON	Action Disconnects 150 v dc from the TRANSMITTER. Connects 750 v dc to TRANSMITTER connector and protects equipment from overloads.
OFF	Disconnects 750 v dc from TRANSMITTER.

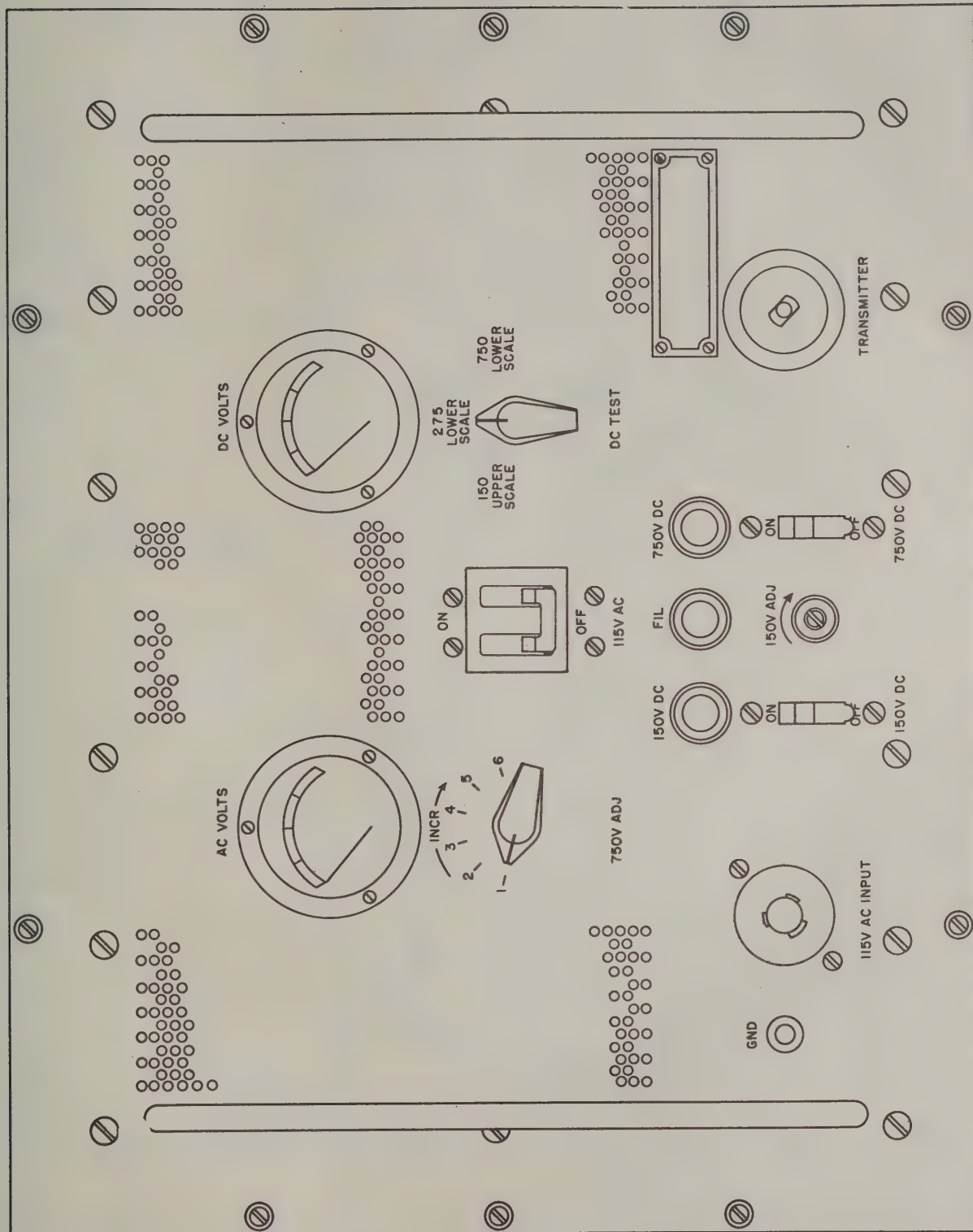
Control or indicator	Function
AC VOLTS meter-----	Indicates voltage applied to equipment.
DC VOLTS meter-----	Indicates voltages to TRANSMITTER connector as selected by DC TEST switch.
DC TEST switch	
<i>Switch Position</i>	<i>Action</i>
150 UPPER SCALE	Applies 150 v dc to DC VOLTS meter.
275 LOWER SCALE	Applies 200 to 350 v dc to DC VOLTS meter.
750 LOWER SCALE	Applies 300 to 900 v dc to DC VOLTS meter.
750V ADJ switch-----	Adjusts output of 750v dc power supply to voltages indicated.
<i>Switch Position</i>	<i>Action</i>
1	300 \pm 20 v dc.
2	650 \pm 25 v dc.
3	700 \pm 30 v dc.
4	750 \pm 30 v dc.
5	800 \pm 35 v dc.
6	850 \pm 35 v dc.

Control or indicator	Function
150V DC indicator (amber)---	Indicates when power is applied to 150-volt supply.
FIL indicator (amber)-----	Indicates when power is applied to equipment.
750V DC indicator (amber)---	Indicates when power is applied to 750-volt supply.
150V ADJ control-----	Adjusts output of 150-volt supply.

11. Transformer, Power, Fixed Auto Transformer TF-167/TRC and Switch Box SA-331/U

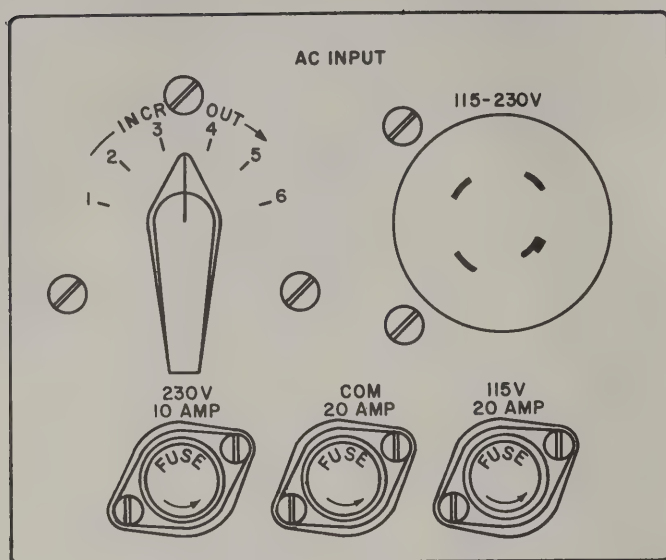
a. *Transformer, Power, Fixed Auto Transformer TF-167/TRC* (A, fig. 24). The INCR OUT switch adjusts the input voltage to 115 ± 5.5 vac which is indicated on the AC VOLTS meter of the PP-685/TRC.

b. *Switch Box SA-331/U* (B, fig. 24). The POWER SUPPLY switch selects one of the two sources of ac power.

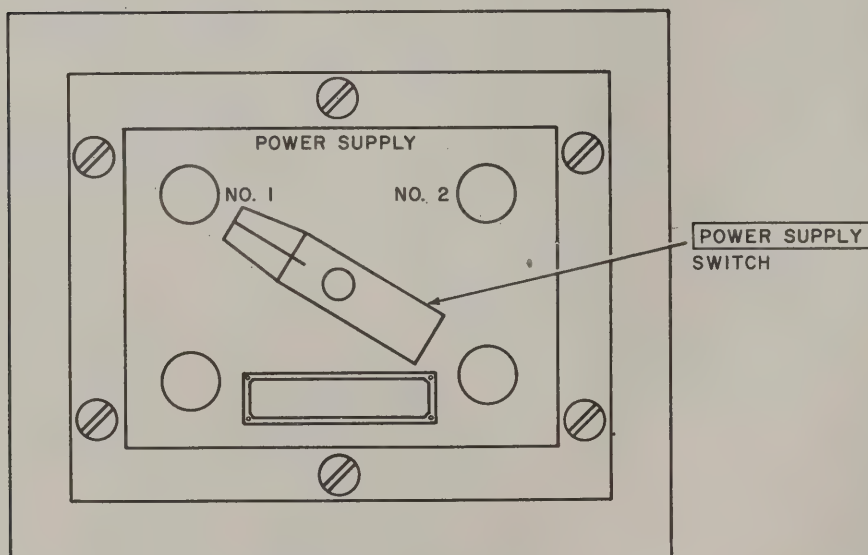


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Figure 23. Power Supply PP-685/TRC, front panel.



A. TF-167/TRC



B. SA-331/U

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Figure 24. Transformer, Power, Fixed Auto Transformer TF-167/TRC and Switch Box SA-331/U, front panels.

Section II. TRANSMITTER TUNING HEADS

12. Amplifier Radio Frequency AM-1180/ GRC (A-Band) (fig. 25)

Control or indicator	Function
PLATE TUNE control.....	Tunes plate circuit of power amplifier.
Plate tune dial.....	Indicates RF channel number and approximate position of PLATE TUNE control.
INPUT LOADING control....	Adjusts effective grid-to-ground resistance of power amplifier.
TRACKING ADJ. control...	Adjusts frequency tracking of power amplifier.
SCREEN VOLTS ADJ. control.	Adjusts screen grid voltage of power amplifier.
OUTPUT COUPLING control.	Adjusts output coupling of power amplifier for maximum output power.

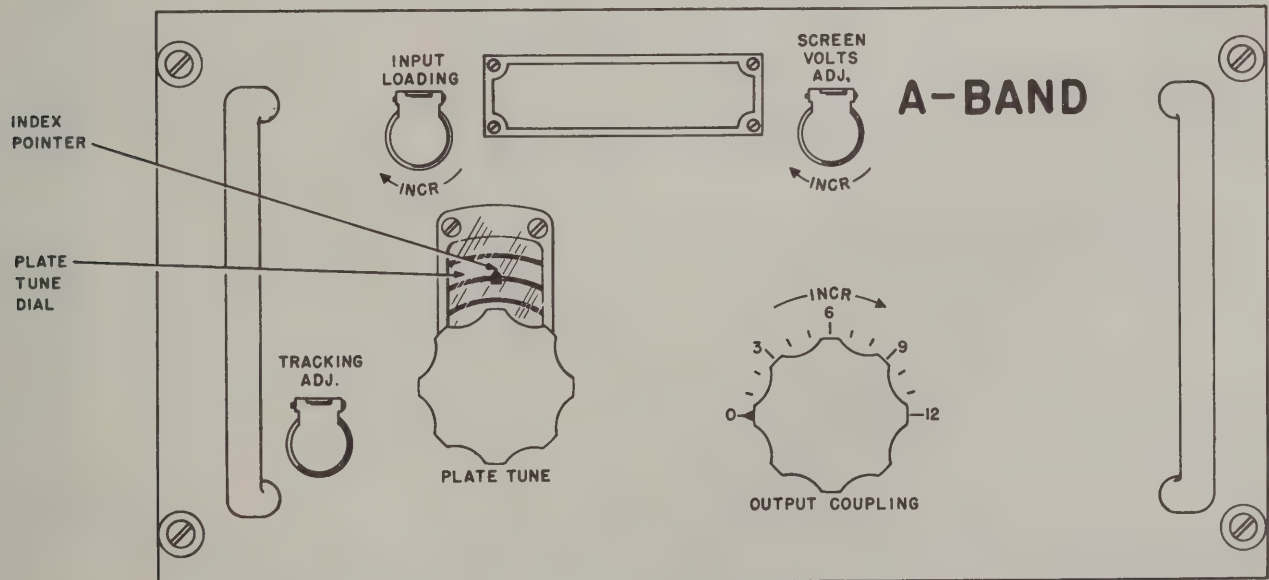
13. Amplifier, Radio Frequency AM-912(*)/TRC (B-Band) (fig. 26)

Control or indicator	Function
GRID control.....	Tunes grid circuit of tuner power amplifier.
GRID dial.....	Indicates RF channel number and approximate position of GRID control.

Control or indicator	Function
PLATE control.....	Tunes plate circuit of tuner power amplifier.
PLATE dial.....	Indicates RF channel number and approximate position of PLATE control.
AMPLIFIER OUTPUT COUPLING control.	Adjusts output coupling of power amplifier.
SCREEN VOLTS ADJ control.	Adjusts screen grid voltage of power amplifier.

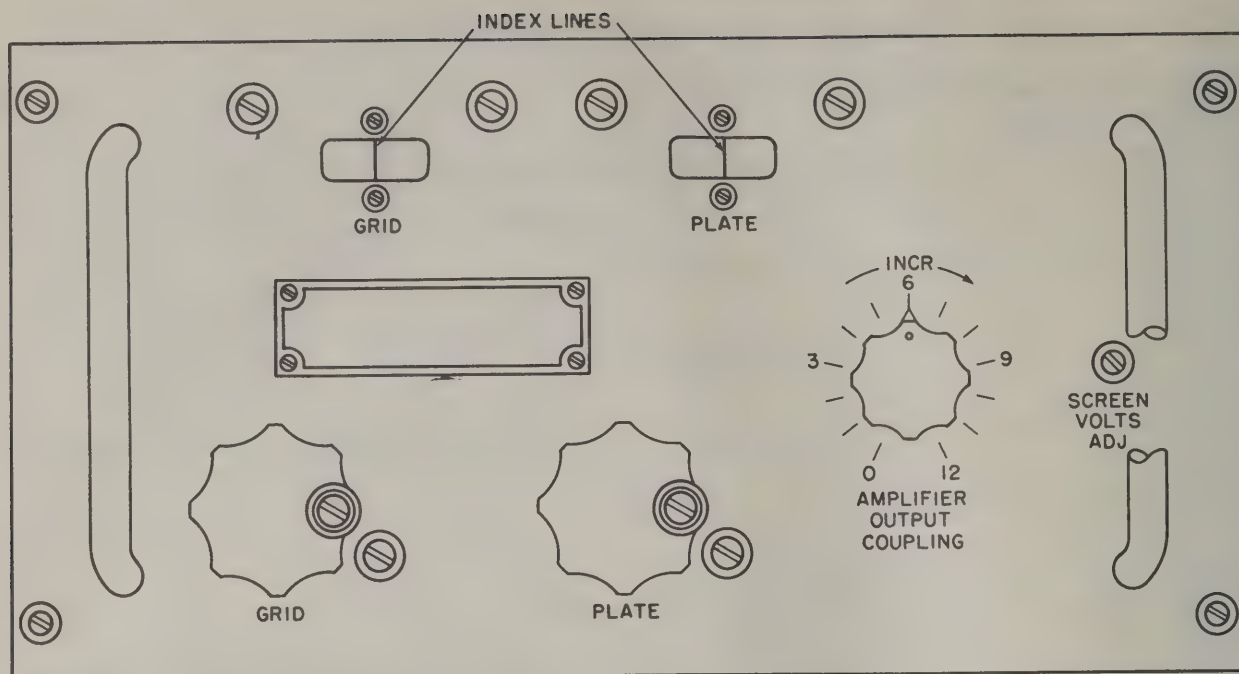
14. Amplifier-Multiplier, Radio Frequency AM-915(*)/TRC (C-Band) (fig. 27)

Control or indicator	Function
Multiplier grid control.....	Tunes grid circuit of tuner frequency multiplier.
MULTIPLIER GRID dial...	Indicates RF channel number and approximate position of multiplier grid control.
Multiplier plate control.....	Tunes plate circuit of tuner frequency multiplier.
MULTIPLIER PLATE dial...	Indicates RF channel number and approximate position of multiplier plate control.
MULTIPLIER OUTPUT COUPLING control.	Adjusts coupling between tuner frequency multiplier and tuner power amplifier.
Power amplifier grid control...	Tunes grid circuit of tuner power amplifier.



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Figure 25. Amplifier, Radio Frequency AM-1180/GRC, front panel.



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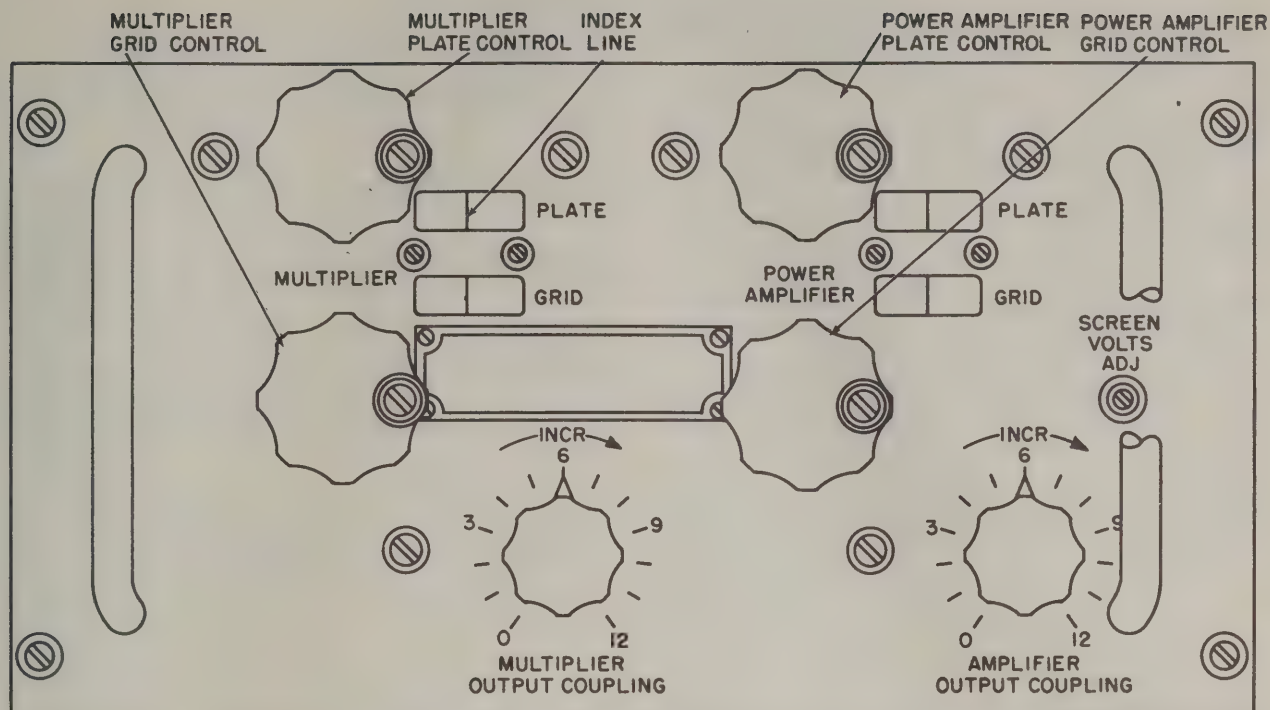
Figure 26. Amplifier, Radio Frequency AM-912/TRC, front panel.

Control or indicator	Function
POWER AMPLIFIER GRID dial.	Indicates RF channel number and approximate position of power amplifier grid control.
Power amplifier plate control ..	Tunes plate circuit of tuner power amplifier.
POWER AMPLIFIER PLATE dial.	Indicates RF channel number and approximate position of power amplifier plate control.
AMPLIFIER OUTPUT COUPLING control.	Adjusts output coupling of tuner power amplifier.
SCREEN VOLTS ADJ control.	Adjusts screen grid voltage of power amplifier.

15. Amplifier-Multiplier, Radio Frequency AM-1178/TRC (D-Band) (fig. 28)

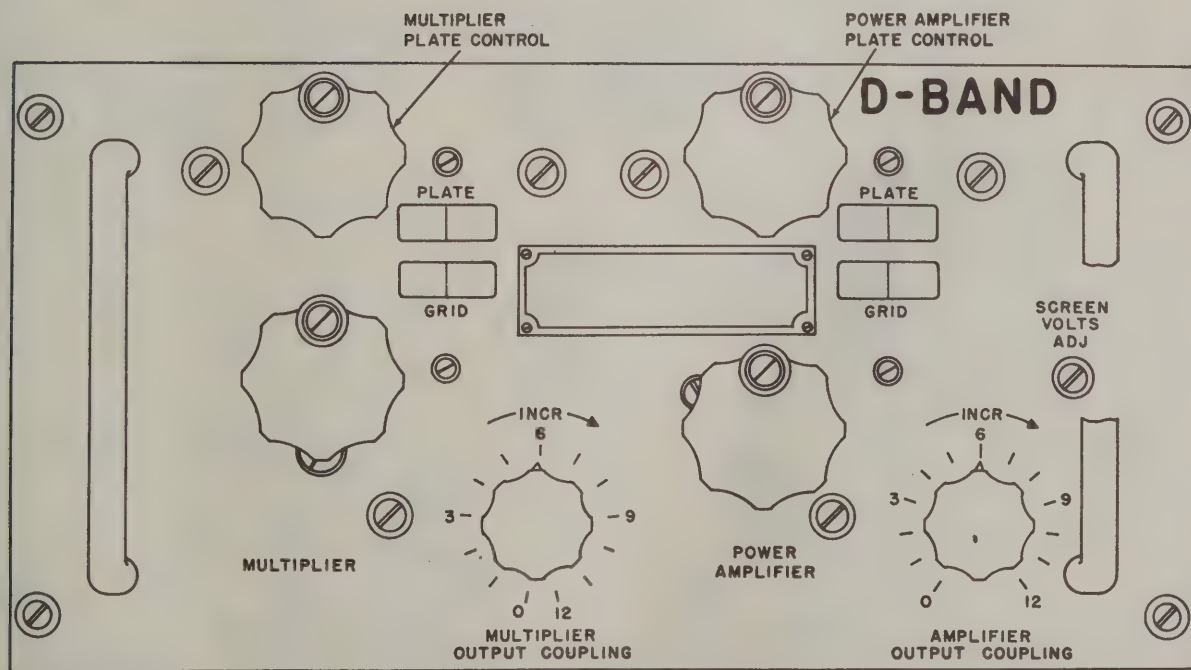
Control or indicator	Function
MULTIPLIER control.....	Tunes grid circuit of tuner frequency multiplier.
GRID dial (left).....	Indicates RF channel number and approximate position of MULTIPLIER GRID control.
Multiplier plate control.....	Tunes plate circuit of tuner frequency multiplier.

Control or indicator	Function
PLATE dial (left).....	Indicates RF channel number and approximate position of multiplier plate control.
MULTIPLIER OUTPUT COUPLING control.	Adjusts coupling between frequency multiplier and power amplifier.
POWER AMPLIFIER control.	Tunes grid circuit of tuner power amplifier.
GRID dial (right).....	Indicates RF channel number and approximate position of POWER AMPLIFIER GRID control.
Power amplifier plate control ..	Tunes plate circuit of power amplifier.
PLATE dial (right).....	Indicates RF channel number selected by power amplifier plate control.
AMPLIFIER OUTPUT COUPLING control.	Adjusts output coupling of tuner power amplifier.
SCREEN VOLTS ADJ control.	Adjusts screen grid voltage of power amplifier.



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Figure 27. Amplifier-Multiplier, Radio Frequency AM-915/TRC, front panel.



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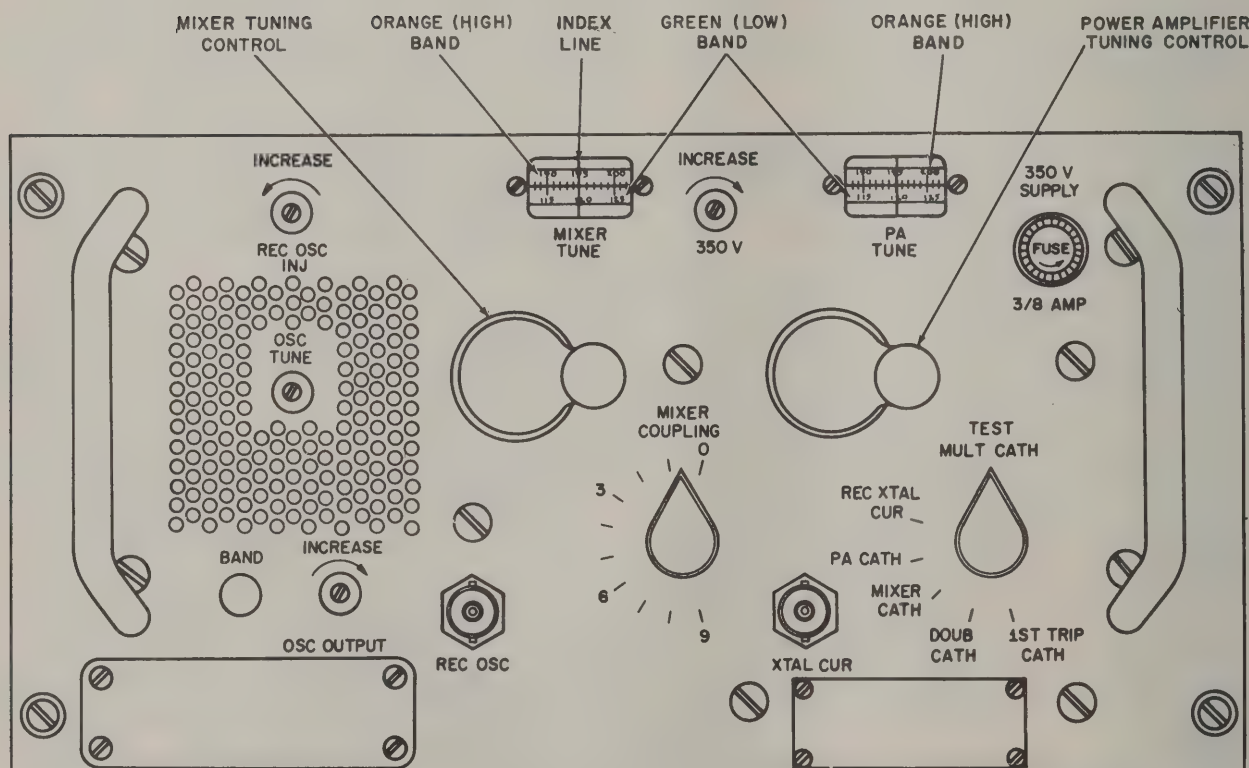
Figure 28. Amplifier-Multiplier, Radio Frequency AM-1178/GRC, front panel.

16. Amplifier-Converter AM-2537/TRA-25 (F-Band)

(fig. 29)

Control or indicator	Function
REC OSC INJ control.....	Adjusts signal strength applied to receiver from oscillator-multiplier.
OSC TUNE control.....	Adjusts RF frequency in doubler cavity of oscillator-multiplier.
OSC OUTPUT control.....	Adjusts signal strength of RF frequency from oscillator-multiplier.
Mixer tuning control.....	Adjusts RF frequency of cavity in mixer circuit.
MIXER TUNE and PA TUNE dials.	Indicates desired RF channel; orange indicates high channel numbers, green indicates low channel numbers.

Control or indicator	Function
350 V voltrol.....	Adjusts voltage applied to circuits from PP-685/TRC.
Power amplifier tuning control.....	Adjusts RF channel frequency of cavity in power amplifier.
MIXER COUPLING control.....	Adjusts RF frequency of cavity in mixer to match RF frequency of cavity in power amplifier.
TEST MULT CATH switch.....	Connects transmitter TEST meter to circuits indicated when TEST switch is in MULT CATH position.
<div> <div>Switch position</div> <div> 1ST TRIP CATH..... DOUB CATH..... MIXER CATH..... PA CATH..... REC XTAL CUR..... </div> </div> <div> <div>Circuit connected</div> <div> Cathode of 1st tripler. Cathode of doubler. Cathode of mixer. Cathode of power amplifier. Crystal mixer diode output of CV-932/TRA-25. </div> </div>	



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Figure 29. Amplifier-Converter AM-2537/TRA-25, front panel.

Section III. RECEIVER TUNING HEADS

17. Amplifier-Converter AM-1179/GRC (A-Band) and AM-913/TRC (B-Band) (fig. 30)

Control or indicator	Function
Tuning control.....	Adjusts frequency of oscillator and RF amplifier circuits.
RF AMP dial.....	Indicates RF channel number selected by tuning control.
AFC control.....	Adjusts afc circuit.
INDEX control.....	Adjusts index line of RF AMP dial.

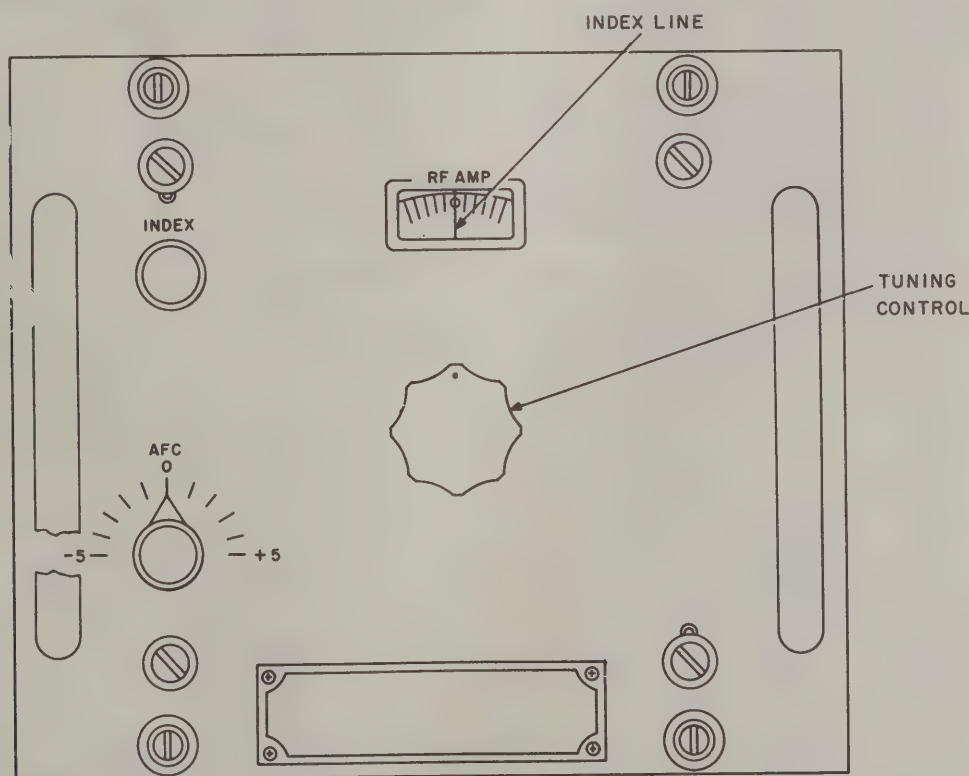
18. Amplifier-Converter AM-914/TRC (C-Band) (fig. 31)

Control or indicator	Function
Tuning control.....	Adjusts frequency of RF amplifier circuits.
COARSE PUSH TO TURN control.	Roughly adjusts frequency of oscillator circuit.

Control or indicator	Function
FINE control.....	Accurately adjusts frequency of oscillator circuit.
OSC dial.....	Indicates RF channel number selected by COARSE PUSH TO TURN and FINE controls.
RF AMP dial.....	Indicates RF channel number selected by tuning control.
INDEX control.....	Adjusts position of index line on OSC dial.
AFC control.....	Adjusts afc circuit.

19. Amplifier-Converter AM-1177/GRC (D-Band) (fig. 32)

Control or indicator	Function
RF amplifier tuning control..	Roughly adjusts frequency of RF amplifier circuit.
Oscillator tuning control.....	Adjusts frequency of oscillator circuit.
AFC control.....	Adjusts afc circuit.



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Figure 30. Amplifier-Converter AM-913/TRC or AM-1179/GRC, front panel.

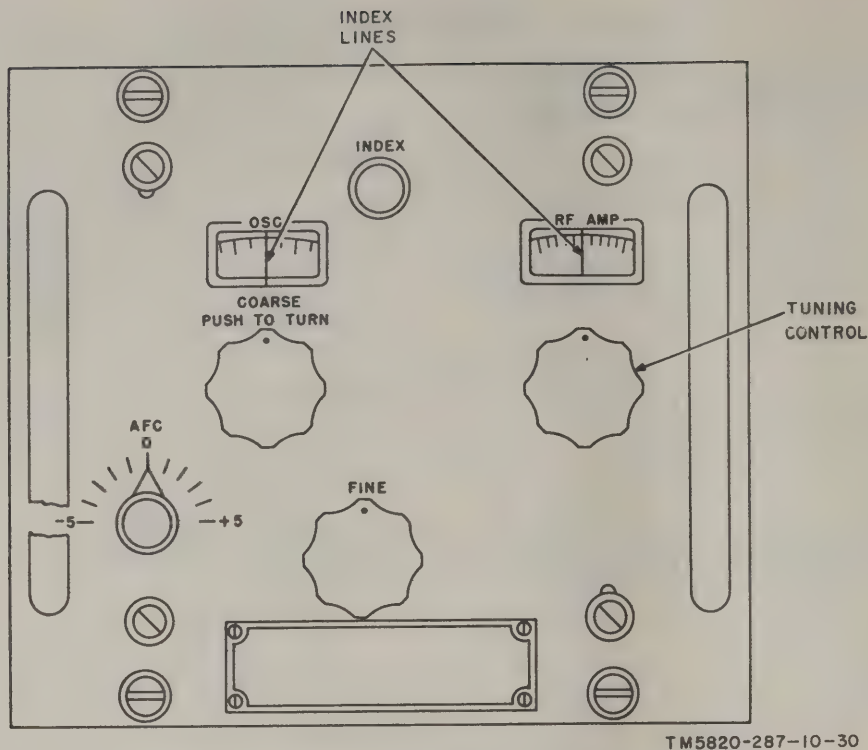


Figure 31. Amplifier-Converter AM-914/TRC, front panel.

Control or indicator	Function
RF AMP dial.....	Indicates RF channel number selected by RF amplifier tuning control.
OSC dial.....	Indicates RF channel number of oscillator selected by oscillator tuning control.
INDEX control.....	Adjusts position of index line on ISC dial.
FINE TUNE control.....	Accurately adjusts frequency of RF amplifier circuit.

20. Mixer Stage, Frequency CV-932/TRA-25 (F-Band) (fig. 33)

Control or indicator	Function
Mixer tuning dial.....	Adjusts mixer preselector circuit to desired RF channel number.
Antenna tuning dial.....	Adjusts antenna preselector circuit to desired RF channel number.
LO FIL TUN control.....	Adjusts bandpass filter to frequency of oscillator-multiplier signal of AM-2537/TRA-25.

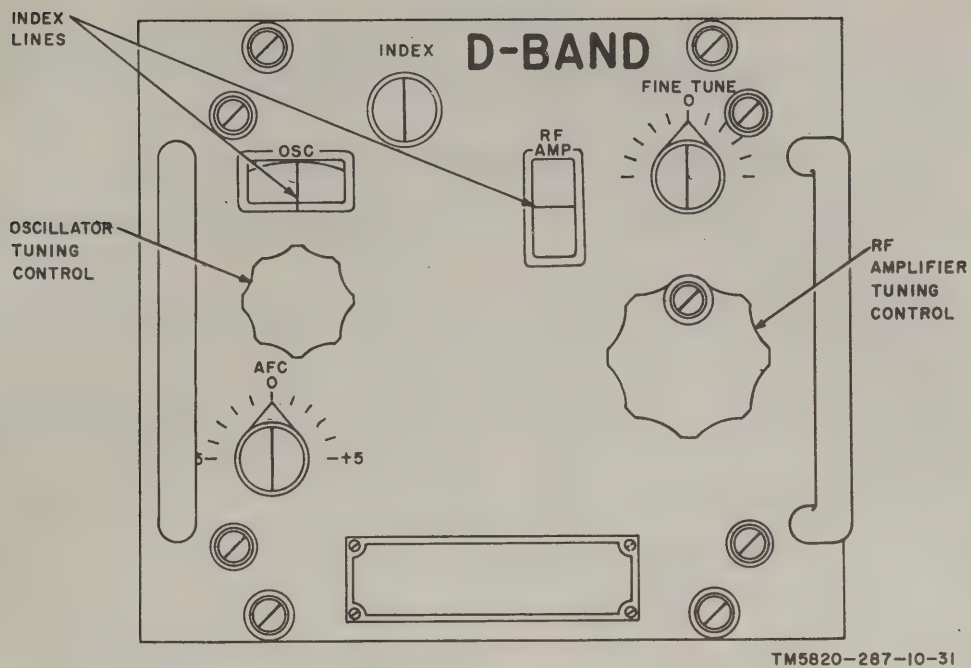


Figure 32. Amplifier-Converter AM-1177/GRC, front panel.

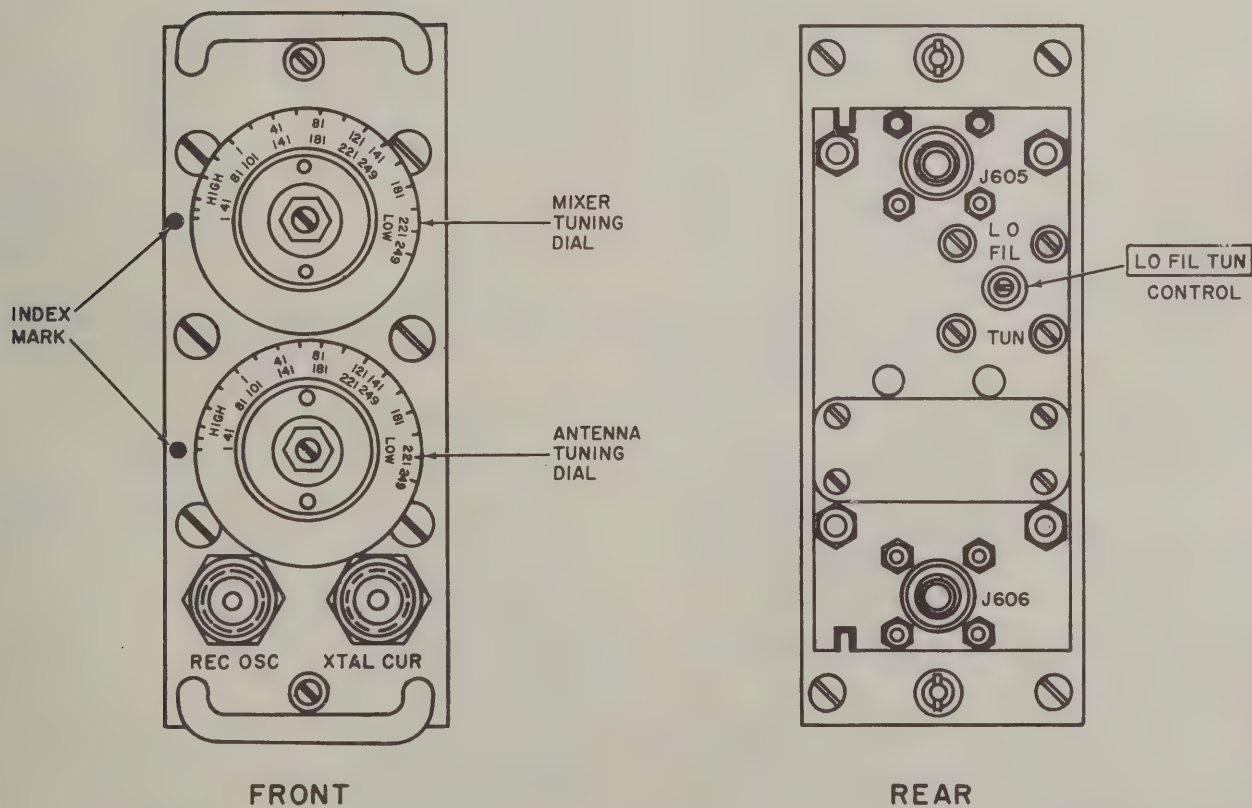


Figure 33. Mixer Stage, Frequency CV-932/TRA-25, front and rear panels.

CHAPTER 3

PREOPERATIONAL PROCEDURES

Section I. TRANSMITTER, RECEIVER, AND POWER EQUIPMENT

21. Transmitter, Radio T-302(*)/TRC

(fig. 21)

a. Settings. Set the controls of the T-302(*)/TRC in the positions indicated in the chart below.

Note. If a bandpass filter is installed in the T-302(*)/TRC, operate its tuning controls to the desired rf channel number.

Caution: When the tuning controls are turned completely counterclockwise, do not force them beyond their stops. If the tuning controls are forced beyond their stops, their calibration will be incorrect.

Control	Setting
INPUT ADJ control.....	OFF.
MEASURE switch.....	RF CHAN TUNE.
AFC switch.....	OFF.
XTAL SEL switch.....	DECADE CHANS.
PULSED OSC switch.....	ODD CHANNELS for odd RF channel number and EVEN CHANNELS for even RF channel numbers.
TUNE control.....	Adjust until desired RF channel number appears under index pointer of odd channel dial or even channel dial.
INDEX control.....	Adjust until index pointer is centered in RF CHANNEL dial.
LOCK control.....	Turn completely counterclockwise.
RF CHANNEL TUNE control.	Adjust until desired RF channel number is centered under index pointer of RF CHANNEL dial.
AFC control.....	0.
DRIVER TUNE control.....	Adjust until desired RF channel number is indicated under index pointer of driver channel dial.
DRIVER OUTPUT COUPLING control.	3 on DRIVER OUTPUT COUPLING dial.
TEST switch.....	DRIVER CATH.
ALARM switch.....	OFF.
THRESHOLD ADJ control..	Fully counterclockwise.

b. Connections.

- (1) Disconnect the CG-1030/U from the ANTENNA jack.
- (2) Connect the CG-718/U between the ANTENNA jack and the input jack of the ME-82/U (fig. 2).

22. Receiver, Radio R-417(*)/TRC

(fig. 22)

Note. If a bandpass filter is installed in the receiver, operate its tuning controls to the desired RF channel number.

a. Settings.

Caution: When the tuning controls are turned completely counterclockwise, do not force them beyond their stops. If the tuning controls are forced beyond their stops, their calibration will be incorrect.

Control	Setting
POWER circuit breaker.....	OFF.
MEASURE switch.....	B+.
SQUELCH control.....	Fully counterclockwise.
ALARM switch.....	NOR.
OUTPUT ADJ control.....	Determine the tuning head in use and operate to applicable setting indicated below. 25 (A-band). 19 (B-band). 15 (C-band). 12 (D-band). 19 (F-band).

b. Connections.

- (1) Remove the CG-1030/U from the ANTENNA jack.
- (2) Connect the CG-1031/U between the ANTENNA jack and the CAL OUT jack.

23. Power Equipment

a. Power Supply PP-685/TRC (fig. 23).

Control	Setting
115V AC circuit breaker.....	OFF.
750V ADJ control.....	2.
750V DC circuit breaker.....	OFF.
150V DC circuit breaker.....	OFF.

b. Transformer, Power, Fixed Auto Transformer TF-167/TRC and Switch Box SA-331/U.

- (1) Set the INCR OUT switch of TF-167/TRC (A, fig. 24) to position 1.

- (2) Set the POWER SUPPLY switch of SA-331/U (B, fig. 24) to position NO. 1 or NO. 2 corresponding to the primary source of

power.
c. *Generator Set, Gasoline Engine PU-286/G.*
Refer to TM 11-940A.

Section II. TRANSMITTER TUNING HEADS

24. Amplifier, Radio Frequency AM-1180/GRC (A-Band)

(fig. 25)

Control	Setting
PLATE TUNE control.....	Adjust until desired RF channel number appears under index pointer of plate tune dial.
OUTPUT COUPLING control.....	6.

25. Amplifier-Multiplier, Radio Frequency AM-912/TRC (B-Band)

(fig. 26)

Control	Setting
GRID control.....	Adjust until desired RF channel number appears under index line of GRID dial.
PLATE control.....	Adjust until desired RF channel number appears under index line of PLATE dial.
AMPLIFIER OUTPUT COUPLING control.....	6.

26. Amplifier-Multiplier, Radio Frequency AM-915(*)/TRC (C-Band)

(fig. 27)

Control	Setting
Multiplier grid control.....	Adjust until desired RF channel number appears under index line of MULTIPLIER GRID dial.
Multiplier plate control.....	Adjust until desired RF channel number appears under index line of MULTIPLIER PLATE dial.
Power amplifier grid control.....	Adjust until desired RF channel number appears under index line of POWER AMPLIFIER GRID dial.

Control	Setting
Power amplifier plate control.....	Adjust until desired RF channel number appears under index line of POWER AMPLIFIER PLATE dial.
MULTIPLIER OUTPUT COUPLING control.....	6.
AMPLIFIER OUTPUT COUPLING control.....	6.

27. Amplifier-Multiplier, Radio Frequency AM-1178/TRC (D-Band)

(fig. 28)

Control	Setting
MULTIPLIER control.....	Adjust until desired RF channel number appears under index line of GRID dial (left).
Multiplier plate control.....	Adjust until desired RF channel number appears under index line of PLATE dial (left).
POWER AMPLIFIER control.....	Adjust until desired RF channel number appears under index line of GRID dial (right).
Power amplifier plate control.....	Adjust until desired RF channel number appears under index line of PLATE dial (right).
MULTIPLIER OUTPUT COUPLING control.....	6.
AMPLIFIER OUTPUT COUPLING control.....	6.

28. Amplifier-Converter AM-2537/TRA-25 (F-Band)

(fig. 29)

Control	Setting
Mixer tuning control.....	Adjust until desired RF channel number appears under index line of MIXER TUNE dial.
Power amplifier tuning control.....	Adjust until desired RF channel number appears under index line of PA TUNE dial.
MIXER COUPLING control.....	6.
TEST MULT CATH switch.....	MIXER CATH.

Section II. RECEIVER TUNING HEADS

29. Amplifier-Converter AM-1179/GRC (A-Band) and AM-913/GRC (B-Band) (fig. 30)

Control	Setting
INDEX control.....	Adjust until index line is centered on RF AMP dial.
Tuning control.....	Adjust until red calibration mark nearest desired RF channel number appears under index line or RF AMP dial.
AFC control.....	0.

30. Amplifier-Converter AM-914/TRC (C-Band) (fig. 31)

Control	Setting
INDEX control.....	Adjust until index line is centered on OSC dial.
COARSE PUSH TO TURN control.	Adjust until red calibration mark nearest desired RF channel number appears under index line of OSC dial.
Tuning control.....	Adjust until RF channel number appearing under index line of OSC dial appears under index line of RF AMP dial.
AFC control.....	0.
FINE control.....	0.

31. Amplifier-Converter AM-1177/GRC (D-Band) (fig. 32)

Control	Setting
INDEX control.....	Adjust until index line is centered on OSC dial.
Oscillator tuning control.....	Adjust until red calibration mark nearest desired RF channel number is under index line of OSC dial.
RF amplifier tuning control...	Adjust until RF channel number indicated under index line of OSC dial is under index line of RF AMP dial.
AFC control.....	0.

32. Mixer Stage, Frequency CV-932/TRA-25 (F-Band) (fig. 33)

Control	Setting
Mixer tuning dial.....	Adjust until desired RF channel number is alined with index mark.
Antenna tuning dial.....	Adjust until desired RF channel number is alined with index mark.

CHAPTER 4

TUNING PROCEDURES

Section I. TRANSMITTER

33. General

Each transmitter tuning head (A-, B-, C-, D-, or F-band) employed in the T-302(*)/TRC requires a slightly different tuning procedure. Paragraph 34 covers those tuning procedures that are applicable to all of the transmitter tuning heads. Paragraphs 35 through 39 cover tuning procedures that are applicable to the A-, B-, C-, D-, or F-band transmitter tuning heads, respectively. Paragraph 40 covers output power and alarm adjustments that are applicable to all of the transmitter tuning heads.

34. Tuning Transmitter, Radio T-302(*)/TRC

- a. Operate the PU-286/G (TM 11-940A).
- b. Operate the 115V AC circuit breaker (fig. 23) to ON.
- c. Operate the INCR OUT switch (fig. 24) until the AC VOLTS meter (fig. 23) indicates 115 volts ± 5.5 .
- d. Operate the 150V DC circuit breaker to ON.
- e. Allow approximately 10 minutes before proceeding.
- f. Operate the DC TEST switch to 150 UPPER SCALE.
- g. Adjust the 150V ADJ control for a 150-volt indication on the DC VOLTS meter.
- h. Operate and hold the XTAL SEL switch (fig. 21) to DISCR CENTER.
- i. Adjust the DISCR CENTER control for a zero indication on the FREQ DRIFT meter. The MEASURE meter will indicate more than 15 microamperes.
- j. Operate the XTAL SEL switch to DECADE CHANS.
- k. Adjust the RF CHANNEL TUNE control for a maximum indication on the MEASURE meter.
- l. Adjust the INDEX control until the index pointer of the radiofrequency (RF) channel dial is over the desired RF channel number.
- m. Operate the XTAL SEL switch to UNIT CHANS.
- n. Adjust the TUNE control for a maximum indication on the MEASURE meter.

o. Operate the LOCK control completely clockwise.

- p. Operate the MEASURE switch to 1 KC ADJ.
- q. Adjust the 1 KC ADJ control for a 0-decibel (db) indication on the MEASURE meter.
- r. Operate the MEASURE switch to MTR CAL.
- s. Adjust the MTR CAL control for a 0-db indication on the MEASURE meter.
- t. Operate the MEASURE switch to DISCR RF DRIVE.
- u. Adjust the DISCR RF DRIVE control for a 0-db indication on the MEASURE meter.
- v. Operate the MEASURE switch to MOD ADJ.
- w. Adjust the MOD ADJ control for a 0-db reading on the MEASURE meter.
- x. Operate and hold the MTR SENS switch to INCR.
- y. Adjust the MOD TRIM control for a maximum indication on the MEASURE meter.

Note. If the indication on the MEASURE meter is beyond full-scale deflection, adjust the MOD ADJ control until the MEASURE meter indication is midscale, and then adjust the MOD TRIM control for a maximum indication on the MEASURE meter.

z. Release the MRT SENS switch.

aa. Adjust the MOD ADJ control for the correct indication on the MEASURE meter as determined from the chart below.

Transmitter tuning head	Indication (db)
AM-1180/GRC (A-band)-----	+2
AM-912(*)/TRC (B-band)-----	+2
AM-915(*)/TRC (C-band)-----	0
AM-1178/GRC (D-band)-----	0
AM-2537/TRA-25 (F-band)-----	+2

ab. Operate the DC TEST switch (fig. 23) to 750 LOWER SCALE.

ac. Operate the 750V DC circuit breaker to ON.

Caution: If the T-302(*)/TRC has been operating for more than 10 minutes, and the 750V DC circuit breaker is operated to OFF, allow a delay of 1 minute before operating the 750V DC circuit breaker to ON. If the 750V DC circuit breaker is operated to ON without a

1-minute delay, the PP-685(*)/TRC may be damaged.

ad. Operate the 750V ADJ switch until an 850-volt ± 35 indication is obtained on the DC VOLTS meter.

ae. Operate the DC TEST switch to 275 LOWER SCALE.

af. Adjust the SCREEN VOLTS ADJ control (350V control on AM-2537/TRA-25 (F-band)) of the tuning head as indicated in the chart below.

Transmitter tuning head	Figure	Adjustment
AM-1180/GRC (A-band).	25	Adjust to provide a minimum indication on DC VOLTS meter.
AM-912(*)/TRC (B-band).	26	Adjust to provide a minimum indication on DC VOLTS meter.
AM-915(*)/TRC (C-band).	27	Adjust to provide a minimum indication on DC VOLTS meter.
AM-1178/GRC (D-band).	28	Adjust to provide a minimum indication on DC VOLTS meter.
AM-2537/TRA-25 (F-band).	29	Adjust to provide +350 volts indication on DC VOLTS meter.

ag. Operate the 750V ADJ control (fig. 23) to 1.

ah. Refer to the chart below and determine which paragraph to use for the applicable transmitter tuning head.

Transmitter tuning head	Paragraph
AM-1180/GRC-(A-band)-----	35
AM-912(*)/TRC (B-band)-----	36
AM-915(*)/TRC (C-band)-----	37
AM-1178/GRC (D-band)-----	38
AM-2537/TRA-25 (F-band)-----	39

35. Amplifier, Radio Frequency AM-1180/GRC (A-Band)

a. Operate the TEST switch (fig. 21) to PWR AMPL GRID.

b. Adjust the DRIVER TUNE and the DRIVER OUTPUT COUPLING controls for a maximum indication on the TEST meter.

c. Adjust the PLATE TUNE and the OUTPUT COUPLING controls (fig. 25) for a maximum indication on the ME-82/U.

d. Operate the DC TEST switch (fig. 23) to 750 LOWER SCALE.

e. Operate the 750V ADJ switch for an indication of 800 volts ± 35 on the DC VOLTS meter.

f. Operate the TEST switch (fig. 21) to PWR AMPL CATH.

g. Adjust the SCREEN VOLTS ADJ. Control (fig. 25) for an indication of 21 microamperes on the TEST meter (fig. 21).

h. Operate the TEST switch to PWR AMPL GRID.

i. Adjust the DRIVER TUNE control for a maximum indication on the TEST meter.

j. Adjust the DRIVER OUTPUT COUPLING control until the TEST meter indicates more than 25 microamperes or until the DRIVER OUTPUT COUPLING control is turned completely clockwise.

k. Repeat the procedures in *c* above.

l. Allow the T-302(*)/TRC 30 minutes to warm up, and repeat the tuning procedures (pars. 34 and 35).

m. The ME-82/U will indicate from 60 to 100 watts. If additional power is required, perform the procedures in (1) through (3) below.

(1) Operate the TEST switch to PWR AMPL CATH.

(2) Adjust the SCREEN VOLTS ADJ. control (fig. 25) for a maximum indication of 25 microamperes on the TEST meter (fig. 21).

Caution: Do not allow the indication on the TEST meter to exceed 25 microamperes. If a 25-microampere indication is exceeded, the power amplifier tubes of the T-302(*)/TRC may be damaged.

(3) Adjust the DRIVER OUTPUT COUPLING and the DRIVER TUNE controls for a maximum indication on the ME-82/U.

Note. The indication on the ME-82/U may be decreased by adjusting the SCREEN VOLTS ADJ. control (fig. 25), or by operating the 750V ADJ control (fig. 23) to a lower position (counterclockwise).

n. Perform the procedures in paragraph 40.

36. Amplifier, Radio Frequency AM-912(*) TRC (B-band)

a. Adjust the DRIVER OUTPUT COUPLING control (fig. 21) until the indication on the DRIVER OUTPUT COUPLING dial is two numbers above the original setting.

b. Operate the TEST switch to DRIVER CATH.

c. Adjust the DRIVER TUNE control until a very slight dip is indicated on the TEST meter.

d. Operate the TEST switch to PWR AMPL GRID.

e. Adjust the GRID control (fig. 26) for a maximum indication on the TEST meter (fig. 21).

f. Operate the 750V ADJ switch (fig. 23) to 2.

g. Adjust the DRIVER TUNE controls (fig. 21) for a maximum indication on the TEST meter.

h. Adjust the DRIVER OUTPUT COUPLING control for a maximum indication of 20 microamperes on the TEST meter.

i. Adjust the PLATE control (fig. 26) and the AMPLIFIER OUTPUT COUPLING control for a maximum indication on the ME-82/U.

j. Operate the DC TEST switch (fig. 23) to 750 LOWER SCALE.

k. Operate the 750V ADJ switch for an indication of 850 volts ± 35 on the DC VOLTS meter.

l. Allow the T-302(*)/TRC 30 minutes to warm up, and repeat the tuning procedures (pars. 34 and 36).

m. The ME-82/U will indicate from 70 to 115 watts. If additional power is required, perform the procedures in (1) through (3) below.

(1) Operate the TEST switch (fig. 21) to PWR AMPL CATH.

(2) Adjust the SCREEN VOLTS ADJ control (fig. 26) for a maximum indication of 25 microamperes on the TEST meter (fig. 21).

Caution: Do not allow the indication on the TEST meter to exceed 25 microamperes. If a 25-microampere indication is exceeded, the power amplifier tubes of the T-302(*)/TRC may be damaged.

(3) Repeat the procedures in i above.

Note. The indication on the ME-82/U may be decreased by adjusting the SCREEN VOLTS ADJ control (fig. 26), or by operating the 750V ADJ control (fig. 23) to a lower position (counterclockwise).

n. Perform the procedures in paragraph 40.

37. Amplifier-Multiplier, Radio Frequency AM-915(*)TRC (C-Band)

a. Operate the TEST switch (fig. 21) to DRIVER CATH.

b. Adjust the DRIVER OUTPUT COUPLING control until the indication on the DRIVER OUTPUT COUPLING dial is two numbers above the original setting.

c. Adjust the DRIVER TUNE control until a very slight dip is indicated on the TEST meter and a maximum indication appears on the ME-82/U.

d. Operate the TEST switch to MULT GRID.

e. Adjust the multiplier grid control (fig. 27) for a maximum indication on the TEST meter (fig. 21).

f. Adjust the DRIVER OUTPUT COUPLING CONTROL for a maximum indication of 20 microamperes on the TEST meter.

g. Operate the MULTIPLIER OUTPUT COUPLING control (fig. 27) two positions higher than its original setting.

h. Operate the TEST switch (fig. 21) to MULT CATH.

i. Adjust the multiplier plate control (fig. 27) for a dip on the TEST meter (fig. 21) and a maximum indication on the ME-82/U.

j. Operate the TEST switch to PWR AMPL GRID.

k. Operate the power amplifier grid control (fig. 27) for a maximum indication on the TEST meter (fig. 21) and the ME-82/U.

l. Adjust the power amplifier plate control (fig. 27) for a maximum indication on the ME-82/U.

m. Adjust the AMPLIFIER OUTPUT COUPLING control for a maximum indication on the ME-82/U.

n. Operate the DC TEST switch (fig. 23) to 750 LOWER SCALE.

o. Operate the 750V ADJ switch for an indication of 750 volts ± 30 on the DC VOLTS meter.

p. Allow the T-302(*)/TRC 30 minutes to warm up, and repeat the tuning procedures (pars. 34 and 37).

q. The ME-82/U will indicate from 70 to 115 watts. If additional power is required, perform the procedures in (1) and (2) below.

(1) Adjust the SCREEN VOLTS ADJ control (fig. 27) for a maximum indication of 25 microamperes on the TEST meter (fig. 21).

Caution: Do not allow the indication on the TEST meter to exceed 25 microamperes. If a 25-microampere indication is exceeded, the power amplifier tubes of the T-302(*)/TRC may be damaged.

(2) Repeat the procedures in l and m above.

Note. The indication on the ME-82/U may be decreased by adjusting the SCREEN VOLTS ADJ control (fig. 27), or by operating the 750V ADJ control (fig. 23) to a lower position (counterclockwise).

r. Perform the procedures in paragraph 40.

38. Amplifier-Multiplier, Radio Frequency AM-1178 TRC (D-Band)

a. Operate the TEST switch (fig. 21) to MULT GRID.

b. Adjust the DRIVER TUNE control for a maximum indication on the TEST meter.

c. Adjust the MULTIPLIER control (fig. 28) for a maximum indication on the TEST meter (fig. 21).

d. Adjust the power amplifier plate control (fig. 28) for a maximum indication on the ME-82/U. If there is no indication on the ME-82/U, follow the procedures in (1) through (3) below in the order given until the indication is obtained; then proceed with *e* below.

(1) Operate the 750V ADJ control to 2 and adjust the power amplifier plate control for a maximum indication on the ME-82/U.

(2) Operate the 750V ADJ control to 3 and adjust the power amplifier plate control for a maximum indication on the ME-82/U.

Caution: If no indication is obtained on the ME-82/U within 60 seconds after operating the 750V ADJ control to 4, as described in (3) below, repeat the tuning procedures in paragraph 35. The power amplifier tube in the AM-1178/GRC may be damaged if this precaution is not observed.

(3) Operate the 750V ADJ control to 4 and adjust the power amplifier plate control for a maximum indication on the ME-82/U.

e. Adjust the multiplier plate control and the POWER AMPLIFIER control for a maximum indication on the ME-82/U.

f. Operate the DRIVER OUTPUT COUPLING control until the test meter (fig. 21) is between 30 and 45 microamperes. If necessary, readjust the MULTIPLIER control (fig. 28), the multiplier plate control, the POWER AMPLIFIER control, and the power amplifier plate control to obtain this indication.

g. Allow the T-302(*)/TRC 30 minutes to warm up, and repeat the tuning procedures (pars. 34 and 38).

h. The ME-82/U will indicate 50 to 100 watts. If additional power is required, perform the procedures in (1) through (3) below.

(1) Operate the TEST switch to PWR AMPL CATH.

(2) Adjust the SCREEN VOLTS ADJ control (fig. 28) for a maximum indication of

25 microamperes on the TEST meter (fig. 21).

Caution: Do not allow the indication on the TEST meter to exceed 25 microamperes. If a 25-microampere indication is exceeded, the power amplifiers of the T-302(*)/TRC may be damaged.

(3) Adjust the DRIVER TUNE control (fig. 21), the MULTIPLIER control (fig. 28), the multiplier plate control, the POWER AMPLIFIER control, and the power amplifier plate control for a maximum indication on the ME-82/U.

Note. The indication on the ME-82/U may be decreased by adjusting the SCREEN VOLTS ADJ control, or by operating the 750V ADJ control (fig. 23) to a lower position (counterclockwise).

i. Perform the procedures in paragraph 40.

39. Amplifier-Converter AM-2537 TRA-25 (F-Band)

a. Operate the DC TEST switch (fig. 23) to 750 LOWER SCALE.

b. Operate the 750V ADJ switch for an indication of 850 volts \pm 35 on the DC VOLTS meter.

c. Operate the TEST switch (fig. 21) to MULT CATH.

d. Operate the TEST MULTH CATH switch (fig. 29) to MIXER CATH.

e. Adjust the DRIVER TUNE control (fig. 21) for a dip on the TEST meter.

f. Adjust the DRIVER OUTPUT COUPLING control for an indication of 30 microamperes on the TEST METER.

g. Adjust the mixer tuning control (fig. 29), the MIXER COUPLING control, and the power amplifier tuning control for a maximum indication on the ME-82/U. The indication on the ME-82/U will be more than 10 watts.

h. Allow the T-302(*)/TRC 30 minutes to warm up, and repeat the tuning procedures (pars. 34 and 39).

i. Proceed as indicated in paragraph 40

40. Adjusting Transmitter, Radio T-302(*)/TRC Output Power and Alarm

When a dummy filter (fig. 1) is installed in the T-302(*)/TRC, follow the procedures in *a* below. When a bandpass filter is installed in place of the dummy filter in the T-302(*)/TRC, follow the procedures in *b* below.

a. Adjustments With Dummy Filter.

- (1) Operate the 750V DC circuit breaker (fig. 23) to OFF.
- (2) Disconnect the CG-718/U with the attached ME-82/U from the ANTENNA jack (fig. 21).
- (3) Connect the CG-1030/U, attached to the transmitter antenna, to the ANTENNA jack.
- (4) Operate the TEST switch to FWD PWR.

Caution: Allow a delay of 1 minute before proceeding. If the following step is performed without a 1-minute delay, the PP-685(*)/TRC may be damaged.

- (5) Operate the 750V DC circuit breaker (fig. 23) to ON and note the indication on the TEST meter (fig. 21).
- (6) Adjust the DRIVER TUNE control for an indication on the TEST meter, which is approximately 70 percent of that noted in (5) above.
- (7) Operate the ALARM switch to NOR.
- (8) Rotate the THRESHOLD ADJ control clockwise until the LOW PWR ALARM indicator illuminates and a buzzer sounds.

Caution: This adjustment is critical. After the LOW PWR ALARM indicator illuminates and the buzzer sounds, further clockwise rotation of the THRESHOLD ADJ control will cause improper calibration. Do not

rotate the THRESHOLD ADJ control more than is required to illuminate the LOW PWR ALARM indicator and sound the buzzer.

- (9) Adjust the DRIVER TUNE control to obtain a maximum indication on the TEST meter; the LOW PWR ALARM indicator will extinguish and the buzzer will not sound.
- (10) Operate the ALARM switch to REV; the LOW PWR ALARM indicator will not illuminate, and the buzzer will sound.
- (11) Repeat the procedure in (6) above; the LOW PWR ALARM indicator will illuminate, and the buzzer will not sound.
- (12) Operate the ALARM switch to NOR and adjust the DRIVER TUNE control for a maximum indication on the ME-82/U.

b. Adjustments With Bandpass Filter.

- (1) Perform the procedures in a(1) through (5) above.
- (2) Adjust the tuning controls on the bandpass filter for a maximum indication on the TEST meter (fig. 21).

Caution: When the tuning controls are turned completely counterclockwise, do not force them beyond their stops. If the tuning controls are forced beyond their stops, their calibration will be incorrect.

- (3) Perform the procedures in a(6) through (12) above.

Section II. RECEIVER

41. General

Each receiver tuning head (A-, B-, C-, D-, or F-band) employed in the R-417(*)/TRC requires a slightly different tuning procedure. Paragraph 42 covers those tuning procedures that are applicable to all of the receiver tuning heads. Paragraphs 43 through 46 cover only those tuning procedures that are applicable to the A-, B-, C-, D-, or F-band receiver tuning heads, respectively. Paragraph 47 covers the output and alarm adjustments that are applicable to all of the receiver tuning heads.

42: Tuning Receiver, Radio R-417(*)/TRC

a. Operate the POWER circuit breaker (fig. 22) to ON.

b. Allow the R-417(*)/TRC 10 minutes to warm up.

c. Operate the MEASURE switch to 2ND LIM.

d. Refer to the chart below and determine which paragraph to use for the applicable receiver tuning head.

Receiver tuning head	Paragraph
AM-1179/GRC (A-band) and AM-913/TRC (B-band).	43
AM-914/TRC (C-band).....	44
AM-1177/GRC-(D-band).....	45
CV-932/TRC-25 (F-band).....	46

43. Amplifier-Converter AM-1179/GRC (A-Band) or AM-913(*)/TRC (B-Band)

a. Turn the SQUELCH control (fig. 22) clockwise until a 5-microampere indication is obtained on the MEASURE meter.

- b. Operate the ALARM switch to REV.
- c. Operate and hold the AFC-OFF-CAL switch to CAL.
- d. Operate the ALARM switch to NOR.
- e. Adjust the tuning control (fig. 30) for a maximum indication on the MEASURE meter (fig. 22) and a zero indication on the FREQ DRIFT meter.
- f. Adjust the INDEX control (fig. 30) until the index line of the RF AMP dial is directly over the red calibration mark nearest the desired RF channel number.
- g. Release the AFC-OFF-CAL switch.
- h. Operate the ALARM switch (fig. 22) to REV.
- i. Adjust the tuning control (fig. 30) until the desired RF channel number is directly under the index line of the RF AMP dial.
- j. Operate the ALARM switch to NOR.
- k. Perform the procedures in paragraph 47.

44. Amplifier-Converter AM-914(*)/TRC (C-Band)

- a. Turn the SQUELCH control (fig. 22) counterclockwise until a 5-microampere indication is obtained on the MEASURE meter.
- b. Operate the ALARM switch to REV.
- c. Adjust the tuning control (fig. 31) for a maximum indication on the MEASURE meter (fig. 22).
- d. Adjust the SQUELCH control so that the indication on the MEASURE meter does not exceed 30 microamperes.
- e. Operate and hold the AFC-OFF-CAL switch to CAL.
- f. Adjust the FINE control (fig. 31) for a zero indication on the FREQ DRIFT meter (fig. 22) and a maximum indication on the MEASURE meter. Note the direction of rotation for the FINE control (fig. 31) when making the final setting.
- g. Release the AFC-OFF-CAL switch (fig. 22).
- h. Adjust the INDEX control (fig. 31) so the index line of the OSC dial is directly over the red calibration mark nearest the desired RF channel frequency.
- i. Adjust the FINE control until the desired RF channel marking is directly under the index line of the OSC dial.

Note. When making the final setting of the FINE control, be sure that the direction of rotation is the same as that noted in *f* above. If it is not, dial backlash error will cause incorrect calibration.

- j. Adjust the tuning control until the desired RF channel marking is directly under the index line of the RF AMP dial.
- k. Perform the procedures in paragraph 47.

45. Amplifier-Converter AM-1177/GRC (D-Band)

- a. Operate and hold the AFC-OFF-CAL switch (fig. 22) to CAL.
- b. Adjust the oscillator tuning control (fig. 32) for a zero indication on the FREQ DRIFT meter (fig. 22).
- c. Adjust the RF amplifier tuning control (fig. 32) for a maximum indication on the MEASURE meter (fig. 22).
- d. Adjust the FINE TUNE control (fig. 32) for a maximum indication on the MEASURE meter (fig. 22).
- e. Release the AFC-OFF-CAL switch.
- f. Adjust the oscillator tuning control (fig. 32) until the desired RF channel number is directly under the index line of the OSC dial.
- g. Adjust the RF amplifier tuning control until the desired RF channel number is directly under the index line of the RF AMP dial.
- h. Adjust the FINE TUNE control for a maximum indication on the MEASURE meter (fig. 22).
- i. Adjust the RF amplifier tuning control (fig. 32) for a maximum indication on the MEASURE meter (fig. 22).

46. Mixer Stage, Frequency CV-932/TRA-25 (F-Band)

- a. Perform the procedures in paragraph 43 for the AM-913(*)/TRC.
- b. Adjust the mixer tuning dial (fig. 33) for a maximum indication on the MEASURE meter (fig. 22).
- c. Adjust the antenna tuning dial (fig. 33) for a maximum indication on the MEASURE meter (fig. 22).
- d. Perform the procedures in paragraph 47.

47. Adjusting Receiver, Radio R-471(*)/TRC Output and Alarm

- a. Disconnect the CG-1031/U from the ANTENNA jack (fig. 22) and the CAL OUT jack.
- b. Connect the CG-718/U between the ANTENNA jack and the ME-82/U.
- c. Rotate the SQUELCH control counterclockwise to a point where a buzzer sounds and the ALARM indicator illuminates.

Caution: This adjustment is critical. After the buzzer sounds and the ALARM indicator illuminates, further counterclockwise rotation of the SQUELCH control will provide improper calibration. Do not rotate the SQUELCH

control more than is required to illuminate the ALARM indicator and sound the buzzer.

- d.* Operate the ALARM switch to REV.
- e.* Operate the AFC-OFF-CAL switch to AFC.
- f.* Disconnect the CG-718/U with the attached ME-82/U from the ANTENNA jack.
- g.* Connect the CG-1030/U attached to the receiving antenna, to the ANTENNA jack.

h. When the carrier signal is present (indicated by a buzzing sound), operate the ALARM switch to NOR.

i. Operate the MEASURE switch to SIG LEV.

j. If a bandpass filter is installed in the R-417(*)/TRC, adjust its controls for a maximum indication on the MEASURE meter.

CHAPTER 5

LINEUP, OPERATING, AND STOPPING PROCEDURES

Section 1. RADIO SECTION LINEUP

48. General

When a radio section consist of a signal radio hop (A, fig. 19), perform the procedures in paragraph 49. When a radio section consists of several radio hops (B, fig. 19), perform the procedures in paragraph 49 for *each* radio hop, and the procedures in paragraph 50 for the overall radio section.

49. Single-Hop Radio Section Lineup

Designate the radio set or radio terminal set at one end of the radio section as station A (control station). Designate the radio set or radio terminal set at the other end of the radio section as station B (end station). Proceed as outlined below.

a. Disconnect the leads on the REC terminals (fig. 22) at stations A and B.

b. Connect a 130-ohm resistor (fig. 16) across the REC terminals (fig. 22) at stations A and B.

c. Perform the following procedures at station A.

(1) Operate the MEASURE switch (fig. 21) to MOD 68 KC IN.

(2) Operate the order-wire circuit (par. 55) and instruct the operator at station B to perform the procedures in *d* below.

(3) Operate the MEASURE switch to MOD ADJ.

d. Perform the following procedures at station B when instructed by the operator of station A.

(1) Operate the MEASURE switch (fig. 22) to 1 KC OUT.

(2) Adjust the OUTPUT ADJ control for a 0-db indication on the MEASURE meter.

(3) Operate the MEASURE switch (fig. 21) to MOD 68 KC IN.

(4) Operate the order-wire circuit (par. 55) and instruct the operator at station A to perform the procedures in *e* below.

(5) Operate the MEASURE switch to MOD ADJ.

e. Perform the following procedures at station A when instructed by the operator of station B.

(1) Operate the MEASURE switch (fig. 21) to MOD 68 KC IN.

(2) Operate the MEASURE switch (fig. 22) to 1KC OUT.

(3) Adjust the OUTPUT ADJ control for a 0-db indication on the MEASURE meter.

(4) Operate the order-wire circuit (par. 55) and instruct the operator of station B to perform the procedures in *f* below.

f. Operate the MEASURE switch to MOD 68 KC IN when instructed by the operator of station A.

g. If the procedures in paragraph 50 are not required, perform the procedures in (1) below. If the procedures in paragraph 50 are required, perform the procedures in (2) below.

(1) *Single-link radio section.*

(a) Disconnect the 130-ohm resistor (fig. 16) from the REC terminals (fig. 22) at stations A and B.

(b) Connect the leads (*a* above) to the REC terminals at stations A and B.

(2) *Multiple-link radio section.*

(a) Disconnect the 130-ohm resistor (fig. 16) from the REC terminals (fig. 22) at all stations except the end stations.

(b) Connect the leads (*a* above) to the REC terminals at all stations except the end stations.

50. Multiple-Link Radio Section Lineup

Perform the procedures in *a* below to line up the links of the radio section for a signal transmitted from the control station to the end station. Perform the procedures in *b* below to line up the links of the radio section for a signal transmitted from the end station to the control station. Perform the procedures in *c* below when the lineup procedures in *a* and *b* below have been completed.

a. *Control-Station to End-Station Lineup.*

(1) Perform the following procedures at the control station:

(a) Operate the order-wire circuit (par. 55) and instruct the operator at the radio relay set or radio repeater set station to perform the procedures in (2) below.

(b) Operate the MEASURE switch (fig. 21) to MOD ADJ.

(2) Perform the following procedures at the

radio relay set or radio repeater set station when instructed by the operator of the preceding station:

- (a) Operate the MEASURE switch (fig. 21) to 1 KC IN.
- (b) Adjust the INPUT ADJ control for a 0-db indication on the MEASURE meter.
- (c) Operate the MEASURE switch to MOD 68 KC IN.
- (d) Operate the order-wire circuit (par. 55) and instruct the operator at the next radio relay or radio repeater station to repeat these procedures.

Note. If the next station is the end station, instruct the operator to perform the procedure in b(1) below.

- (e) Operate the MEASURE switch to 1 KC IN.

b. End-Station to Control-Station Lineup.

- (1) Perform the procedures in a(1) above at the end station.
- (2) Perform the procedures below for each radio relay set or radio repeater set when instructed by the operator of the preceding station.

- (a) Perform the procedures in a(2)(a) through (c) above.
- (b) Operate the order-wire circuit and instruct the operator at the next radio relay or radio repeater station to repeat these procedures.

Note. If the next station is the control station, instruct the operator to perform the procedures in c below.

c. Preparation for Carrier System Lineup.

- (1) Disconnect the 130-ohm resistor (fig. 16) from the REC terminals (fig. 21) at the end stations.
- (2) Connect the leads (par. 49a) to the REC terminals at the end stations.

Section II. CARRIER SYSTEM LINEUP

51. General

The carrier system lineup is performed with the radio section connected to the wire section of the carrier system. The carrier system lineup is controlled by the operator of the carrier telephone terminal of the wire section designated as the control terminal. When the radio section is used with a 4-channel carrier system, follow the procedures in paragraph 52. When the radio section is used with a 12-channel system follow the procedures in paragraph 53.

52. Carrier System Linup (4-channel)

a. Perform the procedures outlined below at the end station of the radio section that connects to the carrier terminal line, when instructed by the control terminal operator.

- (1) Operate the MEASURE switch (fig. 21) to MOD 1 KC IN.
- (2) Adjust the INPUT ADJ control in an indication of the MEASURE meter that corresponds to the indication listed in the chart below.

Transmitter tuning head	Indication
AM-1180/GRC (A-band).....	+2
AM-912(*)/TRC (B-band).....	+2
AM-915(*)TRC (C-band).....	0
AM-1178/GRC (D-band).....	0
AM-2537/TRA-25 (F-band).....	+2

- (3) Operate the MEASURE switch (fig. 22) to 1 KC OUT.
- (4) Adjust the OUTPUT ADJ control for a 0-db indication on the MEASURE meter.

b. Perform the procedures in a above at each station of the radio section until the carrier system lineup has been completed in one direction.

c. Operate the order-wire circuit (par. 55) and inform the control terminal operator that the lineup adjustments have been completed for one direction.

d. When instructed by the control terminal operator, perform the procedures in a through c above for carrier system lineup in the opposite direction.

e. Operate the order-wire circuit (par. 55) and inform the control terminal operator of completion of the carrier system lineup.

53. Carrier System Lineup (12-channel)

a. Perform the procedures below at the end station of the radio section that connects to the carrier terminal line, when instructed by the control terminal operator.

- (1) Operate the MEASURE switch (fig. 21) to MOD 68 KC IN.
- (2) Adjust the INPUT ADJ control for an indication on the MEASURE meter that corresponds to the indication listed in the chart (par. 52a(2)).
- (3) Operate the MEASURE switch (fig. 22) to 68 KC OUT.

(4) Adjust the OUTPUT ADJ control for a 0-db indication on the MEASURE meter.

b. Perform the procedures in *a* above at each station of the radio section until the carrier system lineup procedures have been completed in one direction.

c. Operate the order-wire circuit (par. 55) and inform the terminal office operator that the lineup

adjustments are completed in one direction.

d. When instructed by the control terminal operator, perform the procedures in *a* through *c* above for carrier system lineup in the opposite direction.

e. Operate the order-wire circuit (par. 55) and inform the control terminal operator of completion of the carrier system lineup.

Section III. OPERATING UNDER USUAL CONDITIONS AND STOPPING PROCEDURES

54. Operating Checks

Each day, while the equipment is in service, operate the specified switches to the positions listed on the following charts and observe the meter indications. If the correct meter indications are not obtained, operate the order wire circuit (par. 55) and notify the control terminal operator.

a. *Transmitter, Radio T-302(*)/TRC.*

(1) *MEASURE switch (fig. 21).*

Position	Required indication on MEASURE meter
RF CHAN TUNE-----	5 to 45 μ a.
1 KC ADJ-----	0 db.
MTR CAL-----	0 db.
DISCR RF DRIVE---	0 db.
1 KC IN-----	0 db. (present only when 1-kc test signal is received from carrier terminal equipment).
68 KC IN-----	0 db (present only with 12-channel system).
MOD 1 KC IN:	Present only when 1-kc test signal is received from carrier terminal equipment.
A-band-----	+2 db.
B-band-----	+2 db.
C-band-----	0 db.
D-band-----	0 db.
F-band-----	+2 db.
MOD 68 KC IN:	Present only with 12-channel system.
A-band-----	+2 db.
B-band-----	0 db.
C-band-----	0 db.
D-band-----	0 db.
F-band-----	+2 db.

(2) *TEST switch (fig. 21).*

Position	Required indication on TEST meter
OSC MOD PLATE----	12 to 16 μ a.
DRIVER GRID-----	10 to 16 μ a.
DRIVER CATH-----	25 μ a.

Position	Required indication on TEST meter
MULT GRID:	
A-band-----	Not used.
B-band-----	Not used.
C-band-----	30 to 40 μ a.
D-band-----	30 to 45 μ a.
F-band-----	Not used.
MULT CATH:	
A-band-----	Not used.
B-band-----	Not used.
C-band-----	14 μ a.
D-band-----	10 to 25 μ a.
F-band-----	Refer to (3) below.
PWR AMPL GRID:	
A-band-----	20 to 25 μ a.
B-band-----	20 to 25 μ a.
C-band-----	20 to 25 μ a.
D-band-----	1 to 25 μ a.
F-band-----	Not used.
PWR AMPL CATH:	
A-band-----	25 μ a maximum.
B-band-----	25 μ a maximum.
C-band-----	25 μ a maximum.
D-band-----	25 μ a maximum.
F-band-----	Not used.
FWD PWR:	
A-band-----	30 μ a or higher.
B-band-----	30 μ a or higher.
C-band-----	30 μ a or higher.
D-band-----	30 μ a or higher.
F-band-----	10 μ a or higher.
REFL PWR:	
A-band-----	10 μ a or lower.
B-band-----	10 μ a or lower.
C-band-----	10 μ a or lower.
D-band-----	10 μ a or lower.
F-band-----	2 μ a or lower.

(3) **TEST MULT CATH switch (F-band)** (fig. 29).

Position	Required indication on TEST meter (fig. 21) with TEST switch in MULT CATH
1ST TRIP CATH.....	14 to 16 μ a.
DOUB CATH.....	17 to 20 μ a.
MIXER CATH.....	30 μ a.
PA CATH.....	35 to 45 μ a.
REC XTAL CUR.....	10 μ a.

b. Receiver, Radio R-417()/TRC (fig. 22).*

MEASURE switch position	Required indication on MEASURE meter
OSC.....	15 μ a or higher.
MIX.....	15 μ a or higher.
SIG LEV.....	30 μ a.
1ST LIM.....	10 μ a.
2ND LIM.....	30 μ a.
MTR CAL.....	-5 to +5 db.
1 KC OUT.....	-5 to +5 db.
68 KC OUT.....	-5 to +5 db.
B+.....	+29 to +30 μ a.

c. Power Supply PP-685()/TRC (fig. 23).*

Position on DC TEST switch	Indication on meter (volts)	
	AC VOLTS	DC VOLTS
150 UPPER SCALE.....	115 \pm 5.5	150
750 LOWER SCALE:		
A-band.....	115 \pm 5.5	800
B-band.....	115 \pm 5.5	850
C-band.....	115 \pm 5.5	750
D-band.....	115 \pm 5.5	750
F-band.....	115 \pm 5.5	900
275 LOWER SCALE:		
A-band.....	115 \pm 5.5	275 maximum
B-band.....	115 \pm 5.5	275 maximum
C-band.....	115 \pm 5.5	275 maximum
D-band.....	115 \pm 5.5	275 maximum
F-band.....	115 \pm 5.5	300

55. Order-Wire Operation (fig. 22)

The procedures for initiating a call to other stations in the carrier system are outlined in *a* below. The procedures for answering a call from another station in the carrier system are outlined in *b* below.

a. Initiating Calls.

- (1) Remove Handset H-90/U from the handset rack.
- (2) Operate the TALK-RING switch to TALK.
- (3) Listen to the receiver of the H-90/U to determine whether the order-wire circuit is in use.
- (4) When it has been determined that the order-wire circuit is not in use, hold the TALK-RING switch to RING for approximately 2 seconds.

Note. When station codes are assigned to each individual station, operate the TALK-RING switch to RING and release it according to the station code of the station being contacted.

- (5) Operate the TALK-RING switch to TALK.
- (6) Operate the transmit switch on the H-90/U and speak through the transmitter of the H-90/U.

Note. When listening to the receiver of the H-90/U, it is not necessary to have the transmit switch operated.

b. Answering Calls.

- (1) When a ringing signal is heard, remove the H-90/U from the handset rack.

Note. When station codes are assigned to each station, remove the H-90/U only when the ringing signal corresponds to the station code assignment.

- (2) Operate the TALK-RING switch to TALK
- (3) Perform the procedures given in *a*(6) above.

56. Stopping procedures

- Operate the POWER circuit breaker (fig. 22) to OFF.
- Operate the 750V DC circuit breaker (fig. 23) to OFF.
- Operate the 150V DC circuit breaker to OFF.
- Operate the 115V DC circuit breaker to OFF.
- Turn off the PU-286/U (TM 11-940A).

Section IV. OPERATING UNDER UNUSUAL CONDITIONS

57. General

The radio equipment may have to be operated in regions where extreme cold, heat, humidity or other

moisture, sand conditions, etc, prevail. Although every precaution is taken in the design of the equipment to maintain its technical characteristics over a

wide temperature and humidity range, adverse conditions may cause poor transmission and reception unless additional precautions are taken. Paragraphs 58 through 60 provide procedures that minimize the effects of these unusual climatic conditions.

58. Operation in Arctic Climates

Subzero temperature and climatic conditions associated with cold weather affect the efficient operation of the system. Observe the following instructions and precautions when operating under such adverse conditions:

- a. Keep the equipment warm and dry.
- b. When equipment that has been exposed to the cold is brought into a warm room, moisture will gather on it until the equipment reaches room temperature. This may cause a change in the operating characteristics. When the equipment reaches room temperature, dry it thoroughly. Moisture will also condense on the equipment from exposure during a cold night.

59. Operation in Tropical Climates

When operating in tropical climates, the equipment may be installed in tents, huts, or when necessary in underground dugouts. When the equipment is installed in dugouts, or when it is set up in swampy areas, moisture conditions are more acute than normal. Ventilation is usually very poor, and the high relative humidity causes condensation on the equipment whenever the temperature of the equipment becomes lower than that of the surrounding air. To minimize this condition, provide the best possible ventilation. Dry the equipment thoroughly. This condition may also be minimized by placing lighted electric bulbs near the equipment.

60. Operation in Desert Climates

- a. The main problem that arises with equipment operation in desert areas is the large amount of sand, dust, or dirt that enters the moving parts.
- b. Be careful to keep the equipment as free from dust as possible. Make frequent preventive maintenance checks (par. 64).
- c. Never tie power cords or other wiring connections to either the inside or the outside of tents. Desert areas are subject to sudden wind squalls, which may jerk connections loose or break the lines.
- d. A drop in temperature during the night often causes moisture condensation on the equipment the following day; dry the equipment thoroughly.

e. If the equipment is housed in a building, make the building as dustproof as possible by performing the following:

- (1) Hang wet sacking over the windows and doors.
- (2) Cover the inside walls with heavy paper.

f. If the equipment is housed in a tent, use sand to secure the outside walls of the tent to prevent their flapping in the wind.

61. Operation With Enemy Jamming Interference

When enemy jamming interferes with the reception of the carrier signal, operate the order-wire circuit (par. 55) and notify the control terminal. When instructed by the control terminal operator, detune the R-417(*)/TRC (a below) or change the RF channel frequency (b below).

a. Detuning R-417(*)/TRC.

- (1) Detune the receiver tuning head slightly above or below the operating RF channel frequency. The chart below lists the control or controls for the applicable tuning head.

Receiver tuning head	Control
AM-1179/GRC (A-band) and AM-913/TRC (B-band).	Tuning control (fig. 30).
AM-914/TRC (C-band)-----	Tuning control (fig. 30).
AM-1177/GRC (D-band):----	Rf amplifier tuning control (fig. 32).
CV-932/TRA-25 (F-band)---	Antenna tuning dial (fig. 33) and tuning control (fig. 30) of AM-913(*)/TRC.

- (2) Adjust the SQUELCH control (fig. 22) for best reception. If the reception does not improve, turn the SQUELCH control completely clockwise.
- (3) Adjust the tuning controls of the bandpass filter in the R-417(*)/TRC slightly above or below the operating RF channel frequency to attenuate the enemy jamming signal.
- (4) Adjust the OUTPUT ADJ control for a maximum indication on the MEASURE meter.
- (5) Operate the order-wire circuit (par. 55) and notify the control office of the effect that the detuning procedures had on the interference caused by the enemy jamming signal.

b. Changing RF Channel Frequency.

- (1) Perform the starting procedures (ch. 4).
- (2) Perform the lineup procedures (pars. 48—53).

- (3) Operate the order-wire circuit (par. 55) and notify the control terminal when the procedures in (1) and (2) above are complete.

CHAPTER 6

MAINTENANCE INSTRUCTIONS

62. Scope of Operator's Maintenance

The following is a list of maintenance duties normally performed by the operator of the radio equipment. These procedures do not require special tools or test equipment.

- a. Preventive maintenance of the PU-286/U (TM 11-940A).
- b. Preventive maintenance of the radio equipment (par. 64).
- c. Visual inspection (par. 65).
- d. Operator's troubleshooting checklist (par. 66).

63. Tools and Materials Required

Refer to appendix II for a list of the operator's repair parts. The tools and materials required for preventive maintenance are listed below.

- a. Lint-free cloth.
- b. Insulation Tape, Electrical TL-83 (fig. 5).
- c. Insulation Tape, Electrical TL-192 (fig. 5).
- d. Cleaning Compound (Federal Stock No. 7930-395-9542).
- e. Screwdriver TL-358/U (fig. 2).
- f. Stiff bristle brush.

64. Preventive Maintenance

a. *DA Form 11-238.* Items 1 through 12 on DA Form 11-238 (figs. 34 and 35) constitute the preventive maintenance checklist to be used by the operator. Items not applicable to the equipment are lined out in the figures. References in the ITEM block in the figures are to items in those paragraphs which contain additional maintenance information pertinent to the particular item. Instructions for the use of DA Form 11-238 appears on page one of the form.

b. *Items.* The information shown in this paragraph is supplementary to DA Form 11-238. The item numbers correspond to the ITEM numbers on the form. *Do not* perform the maintenance procedures in items 2 and 7 with the power on. These maintenance procedures should be performed during interruptions in system service.

Item No.	Maintenance procedures
2	If necessary, wet a cloth with cleaning compound and clean the parts; dry the parts with a lint-free cloth.
3	When equipment is operating, check, only those controls listed in the operating checks (par. 54).
7	Repair any cuts in the insulation by covering them with Insulation Tape, Electrical TL-83 and TL-192.
8	Tape all loose ends of guy wires to the taut guy wires.

Warning: Cleaning compound is flammable and its fumes are toxic. Do not use near a flame; provide adequate ventilation.

65. Visual Inspection

a. When the equipment fails to operate properly operate the order-wire circuit (par. 55), request permission from the circuit control authority to turn off the power, and check the items listed below. *Do not check any items with the power on.*

- (1) Worn or broken cables.
- (2) Loose or improper seating of connectors.
- (3) Damaged lighting protectors (fig. 22).
- (4) Improper settings of switches or controls.
- (5) Improper seating of bandpass or dummy filter in T-302(*)/TRC or R-417(*)/TRC.
- (6) Improper seating of transmitter tuning head in T-302(*)/TRC.
- (7) Improper seating of receiver tuning head in R-417(*)/TRC.
- (8) Loose or poor ground connections.
- (9) Ground Rod MX-148/G not imbedded in moist ground.

b. If the above checks do not locate the trouble, refer to the operator's troubleshooting checklists (par. 66).

66. Operator's Troubleshooting Checklists

a. *General.* The troubleshooting checklists will help the operator correct abnormal conditions encountered during the starting procedures (ch. 4), lineup procedures (pars. 48-51), and operating procedures (pars. 54 and 55). Only those corrective measures that the operator can accomplish are given. If the corrective measures given do not restore normal equipment performance, troubleshooting by

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS		CONDITION
26. INSPECT ANTENNA FOR ECCENTRICITIES-CORROSION- LOOSE FIT-DAMAGED INSULATOR AND REFLECTOR.		
27. CHECK FOR NORMAL OPERATION.		
28. BEFORE SHIPPING OR STORING- REMOVE BATTERIES.		
<p>IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION.</p> <p>ITEM 7. FRAYED CABLE ASSEMBLY CX-2253/U BETWEEN PP-685/U AND T-302/TRC. REPORTED TO HIGHER ECHELON FOR REPLACEMENT.</p>		

MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT SOUND EQUIPMENT, RADIO, DIRECTION FINDING RADAR, CARRIER, RADIOSONDE AND TELEVISION (AR 750-625)																										
EQUIPMENT NOMENCLATURE RADIO SET AN/TRC-24																										
EQUIPMENT SERIAL NUMBER 130																										
<p>INSTRUCTIONS</p> <p>This form may be used for a period of one month by using the correct dates and weeks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.</p> <p>1. For detailed Preventive Maintenance instructions see: a. The Technical Manual (in TM 11 series) for the equipment. (See DA Pamphlet Number 310-4) b. The Supply Bulletin (SB 11-100 series) for the equipment. (See DA Pamphlet Number 310-4) c. The Department of the Army Lubrication Order. (See DA Pamphlet Number 310-4)</p> <p>2. The following action will be taken by either the Communications Officer/Chief for 1st echelon, or the Inspector for higher echelon: a. Enter Equipment Nomenclature and Serial Number. b. Strike out items that do not apply to the equipment.</p> <p>3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.</p> <p>4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.</p>																										
<p>TYPE OF INSPECTION</p> <table border="1"> <thead> <tr> <th>OPER- ATOR</th> <th>2/3 EC- ELON</th> <th>DATE</th> <th>SIGNATURE</th> </tr> </thead> <tbody> <tr> <td>✓</td> <td></td> <td>15 JULY 1960</td> <td>Charles W. Brown</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			OPER- ATOR	2/3 EC- ELON	DATE	SIGNATURE	✓		15 JULY 1960	Charles W. Brown																
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DA FORM 11-238

REPLACES DA FORMS 11-238, 1 NOV 55; 11-239, 1 MAR 56; 11-240, 11-246, 11-250, AND 11-281; WHICH ARE OBSOLETE

TM 5820-287-10-33

Figure 34. DA Form 11-238 (pages 1 and 4).

LEGEND for marking conditions:		DAILY CONDITION FOR MONTH OF																		
Satisfactory, ✓. Adjustment, Repair or Replacement required, X. Defect corrected, (X).		JULY 1960																		
NO.	DAILY ITEM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	2D 3D ECH- ELON		
1.	COMPLETENESS AND GENERAL CONDITION OF EQUIPMENT. (Transmitter, receiver, carrying cases, wire, cables, microphones , other spare parts, technical manuals).	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
2.	CLEAN DIRT AND MOISTURE FROM ANTENNA, PHONE-HEADSET , JACKS, PLUGS, COMPONENT PANELS.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
3.	INSPECT CONTROLS FOR NORMAL OPERATION. TAP CONTROLS LIGHTLY FOR EVIDENCE OF CUT-OUT FROM LOOSE CONTACTS.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
4.	CHECK FOR NORMAL OPERATION OF EQUIPMENT. BE ALERT FOR UNUSUAL OPERATION OR CONDITION.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
WEEKLY		CONDITION EACH WEEK																	2D 3D ECH	
		1ST	2D	3D	4TH	5TH														
5.	CLEAN AND TIGHTEN EXTERIORS OF CASES, RACKS, MOUNTS, TRANSMISSION LINES.	✓																		
6.	INSPECT CASES, MOUNTS, ANTENNA TOWERS AND EXPOSED METAL SURFACES FOR RUST, CORROSION.	✓																		
7.	INSPECT CORDS, CABLE, WIRE, SHOCK MOUNTS FOR CUTS, KINKS, BREAKS, FRAYING, UNDUE STRAIN.	X																		
8.	CHECK ANTENNA GUY WIRES FOR PROPER TENSION OR DAMAGE.	✓																		
9.	INSPECT CANVAS AND LEATHER ITEMS FOR MILDEW, TEARS, FRAYING.	✓																		
10.	INSPECT ACCESSIBLE ITEMS FOR LOOSENESS: SWITCHES, KNOBS, JACKS, CONNECTORS, RELAYS, TRANSFORMERS, MOTORS, PILOT LIGHTS, BLOWERS, ETC.	✓																		
11.	CLEAN AND/OR INSPECT AIR FILTERS, BRASS NAME PLATES, DIAL AND METER WINDOWS.	✓																		
12.	INSPECT STORAGE BATTERIES FOR DIRT, LOOSE TERMINALS, FREIGHT BRAKES, DAMAGED CASES, INSPECT DRY BATTERIES FOR LEAKAGE.																			
ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS																			CONDITION	
13.	INSPECT SHELTERS AND COVERS FOR ADEQUACY OF WEATHER PROOFING. TEARS, FRAYING.																			
14.	CHECK TERMINAL BOX COVERS FOR CRACKS, DIRT, TEARS, DAMAGED GASKETS, GREASE.																			
ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS																			CONDITION	
15.	INSPECT SEATING OF READILY ACCESSIBLE PLUG-OUT ITEMS: TUBES, LAMPS, FUSES, CRYSTALS, CONNECTORS, VIBRATORS, PLUG-IN COILS.																			
16.	INSPECT RELAYS AND CIRCUIT BREAKERS FOR LOOSE MOUNTINGS, BAD CONTACTS, MISALIGNMENT OF CONTACTS AND SPRINGS, PROPER SPRING TENSION.																			
17.	INSPECT VARIABLE CAPACITORS FOR DIRT, MISALIGNMENT OF PLATES, LOOSE MOUNTINGS, MOISTURE.																			
18.	INSPECT RESISTORS, BURNING AND INSULATORS FOR CRACKS, CHIPPING, BLISTERING, MOISTURE, DISCOLORATION.																			
19.	CLEAN AND TIGHTEN SWITCHES, TERMINAL BLOCKS, BLOWERS, RELAY CASES AND INTERIORS OF CHASSIS AND CASES NOT READILY ACCESSIBLE.																			
20.	INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS AND BREAKS.																			
21.	INSPECT TERMINALS OF LARGE FIXED CAPACITORS AND RESISTORS FOR DIRT, CORROSION, LOOSE CONTACTS.																			
22.	INSPECT TRANSFORMERS, CHOKES, POTENTIOMETERS AND RHEOSTATS FOR OVERHEATING AND OIL LEAKAGE.																			
23.	INSPECT GENERATORS, AMPLIFIERS, DYNA-MOTORS FOR BRUSH WEAR, SPRING TENSION, ARCING AND FITTING OF COMMUTATOR.																			
24.	INSPECT CATHODE RAY TUBES FOR BURNED GREEN SPOTS.																			
25.	INSPECT WATERPROOF GASKETS FOR LEAKS, WORN OR LOOSE PARTS.																			

CONTINUED ON PAGE 4

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Figure 85. DA Form 11-238 (pages 2 and 3).

TM 5820-287-10-34

higher echelon maintenance personnel is required. the time of failure and the corrective measure taken.
Note on a repair tag how the equipment performed at

b. Power Equipment Checklist.

Item No.	Symptom	Probable cause	Correction
1	AC VOLTS meter (fig. 23) indicates zero and FIL indicator does not illuminate.	Defective PU-286/U----- Defective fuses in TF-167/TRC (A, fig. 24) or J-532/U (fig. 2). Loose or improperly seated connectors on 115V AC INPUT connector (fig. 23), 115-230V connector (A, fig. 24), or connectors on J-532/U (fig. 2). Damaged interconnecting cables or defective 115V AC circuit breaker.	Refer to TM 11-940A. Replace defective fuses (par. 67b). Check seating of connectors. Higher echelon maintenance required.
2	AC VOLTS meter indicates zero and FIL indicator illuminates.	Defective AC VOLTS meter-----	Higher echelon maintenance required.
3	AC VOLTS meter indicates correct voltage and FIL indicator does not illuminate.	Defective lamp in FIL indicator-----	Replace lamp in FIL indicator (par. 67a).
4	With DC TEST switch in 150 UPPER SCALE: DC VOLTS meter indicates zero and 150V DC indicator does not illuminate. DC VOLTS meter indicates zero and 150V DC indicator illuminates. DC VOLTS meter indicates correct voltage and 150V DC indicator does not illuminate.	Defective 150V DC circuit breaker---- Defective DC VOLTS meter or DC VOLTS meter circuit. Defective lamp in 150V DC indicator--	Higher echelon maintenance required. Higher echelon maintenance required. Replace lamp in 150V DC indicator (par. 67a).
5	With DC TEST switch in 750 LOWER SCALE: DC VOLTS meter indicates zero and 750V DC indicator does not illuminate. DC VOLTS meter indicates zero and 750V DC indicator illuminates. DC VOLTS meter indicates correct voltage and 750V DC indicator does not illuminate.	Defective 750V DC circuit breaker---- Defective DC VOLTS meter----- Defective lamp in 750V DC indicator--	Higher echelon maintenance required. Higher echelon maintenance required. Replace lamp in 750V DC indicator (par. 67a).
6	With DC TEST switch in 275 LOWER SCALE, DC VOLTS meter indicates zero.	Defective DC VOLTS meter circuit----	Higher echelon maintenance required.

c. Transmitter Checklist.

1	No indication on MEASURE meter (fig. 21) for any setting of MEASURE switch.	Loose or improperly seated connector on POWER SUPPLY connector (fig. 21) or TRANSMITTER connector (fig. 23). Damaged interconnecting cable or defective MEASURE meter (fig. 21).	Check seating of connectors. Higher echelon maintenance required.
2	FREQ DRIFT meter cannot be adjusted for correct indication with DISCR CENTER control.	Defective FREQ DRIFT meter or FREQ DRIFT meter circuit.	Higher echelon maintenance required.
3	MEASURE meter cannot be adjusted for correct indication for various positions of MEASURE switch.	Defective circuits-----	Higher echelon maintenance required.

Item No.	Symptom	Probabl cause	Correction
4	No indication on TEST meter for any setting of TEST switch.	Defective TEST meter-----	Higher echelon maintenance required.
5	TEST meter cannot be adjusted for correct indication when DRIVER TUNE or DRIVER OUTPUT COUPLING controls are adjusted.	Defective circuits in transmitter-----	Higher echelon maintenance required.
6	TEST meter cannot be adjusted for correct indication when controls of transmitter tuning head are adjusted.	Transmitter tuning head not seated properly in transmitter.	Check seating of transmitter tuning head.
7	ME-82/U cannot be adjusted for correct indication when controls of transmitter tuning head are adjusted.	Bandpass filter or dummy filter not seated properly in transmitter.	Check seating of bandpass filter or dummy filter.
		Loose or improperly seated connector on ANTENNA jack or ME-82/U.	Check seating of connectors.
		Defective ME-82/U-----	Replace ME-82/U.
		Defective CG-718/U between ANTENNA jack and ME-82/U	Replace CG-718/U.
8	LOW POWER ALARM indicator will not illuminate under any condition.	Defective lamp in LOW PWR ALARM indicator.	Replace lamp in LOW PWR ALARM indicator (par. 67a).
9	Buzzer will not sound under any condition.	Defective buzzer or transmitter circuit.	Higher echelon maintenance required.
10	DRIVER OUTPUT COUPLING control cannot be adjusted for a 35 ± 1 microampere indication on the TEST meter with the TEST switch in PWR AMPL GRID position when using the A-band transmitter tuning head.	INPUT LOADING adjustment of AM-1180/GRC incorrect.	Perform input loading adjustment (par. 68a).
11	Rf channel number indication on plate tune dial (fig. 25) of AM-1180/GRC (A-band) incorrect.	Tracking adjustment of AM-1180/GRC incorrect.	Perform tracking adjustment (par. 68b).

d. Receiver Checklist (fig. 21).

1	POWER indicator does not illuminate when POWER switch is operated to ON.	Defective lamp in POWER indicator. Loose or improperly seated connector in AC connector. Damaged interconnecting cable or POWER switch.	Replace lamp in POWER indicator (par. 67a). Check seating of connector. Higher echelon maintenance required.
2	MEASURE meter and FREQ DRIFT meter cannot be adjusted for correct indications from receiver tuning head.	Receiver tuning head not seated properly in receiver.	Check seating of receiver tuning head.
3	ALARM indicator does not illuminate under any condition.	Defective lamp in ALARM indicator.	Replace lamp in ALARM indicator (par. 67a).
4	Buzzer does not sound under any condition.	Defective buzzer or receiver circuit.	Higher echelon maintenance required.
5	Order-wire circuit does not operate----	Loose or improperly seated connector in TRANSMITTER connector.	Check seating of connector.

67. Repairs

Operator's repairs consist of replacement of the indicator lamps (a below) and front panel fuses (b below).

a. Indicator Lamps.

- (1) Unscrew the jewel lens from the indicator.
- (2) Unscrew the defective lamp and re-

move it from the socket.

- (3) Screw a new lamp into the lamp socket.

- (4) Screw the jewel lens into place.

b. Front Panel Fuses.

- (1) Unscrew the fuse cap and remove the defective fuse.

- (2) Insert a new fuse of the correct rating into the fuseholder, and screw in the fuse cap.

68. Adjustments

Operator's adjustments consist of input loading adjustments (*a* below) and tracking adjustment (*b* below) on the AM-1180/GRC (A-band).

a. Loading Adjustments. Perform the procedures below when the AM-1180/GRC (A-band) has not been used for at least 1 month or when the correct reading cannot be obtained on the TEST meter (fig. 21) during the starting procedures for the A-band transmitter tuning head.

- (1) Perform the procedures in paragraphs 21, 23, and 24 for RF channel No. 1.
- (2) Perform the procedures in paragraph 34.
- (3) Perform the procedures in paragraphs 35*a* through *i*.
- (4) Operate the INPUT LOADING control (fig. 25) completely counterclockwise.
- (5) Adjust the DRIVER OUTPUT COUPLING (fig. 21) for a maximum indication on the TEST meter.

Note. If the TEST meter indication is beyond full scale, turn the INPUT LOADING control (fig. 25) clockwise and then adjust the DRIVER OUTPUT COUPLING control (fig. 21) and the

DRIVER TUNE control for a maximum indication on the TEST meter.

- (6) Adjust the INPUT LOADING control (fig. 25) for an indication of 35 microamperes ± 1 on the TEST meter (fig. 21).
 - (7) Operate the TEST switch to PWR AMPL CATH.
 - (8) Adjust the SCREEN VOLTS ADJ. control (fig. 25) for an indication of 21 microamperes on the TEST meter (fig. 21).
 - (9) Adjust the DRIVER TUNE control and the DRIVER OUTPUT COUPLING control for a maximum indication on the ME-82/U.
 - (10) Repeat the procedures given in (6) above.
 - (11) Perform the stopping procedures (par. 56).
- b. Tracking Adjustments.*
- (1) Perform the procedures in paragraphs 21, 23, and 24 for RF channel No. 100.
 - (2) Perform the procedures in paragraphs 34 and 35.
 - (3) Operate the PLATE TUNE control (fig. 25) until RF channel No. 100 appears under the index pointer of the plate tune dial.
 - (4) Adjust the TRACKING ADJ. control for a maximum indication on the ME-82/U.
 - (5) Perform the stopping procedures (par. 56).

CHAPTER 7

MATERIEL USED IN CONJUNCTION WITH RADIO EQUIPMENT SETS

69. Tower AB-216/U

The AB-216/U may be substituted for the mast assembly of Antenna Accessories Group OA-1398/GRC when the antennas must be installed higher than 50 feet above the ground. The height of the AB-216/U is approximately 78 feet (TM 11-5073).

70. Interoperation With British Wireless Set C-41.

a. C-41 Transmitter. When the transmitter of the C-41 is used with Receiver, Radio R-417(*)/TRC in a four-channel carrier system, no modifications are necessary. When the transmitter of the C-41 is used with the R-417(*)/TRC in a 12-channel carrier system, modifications listed in either (1) or (2) below are required.

(1) An attenuation circuit must be substituted for the deemphasis circuit of the R-417(*)/TRC.

(2) An equalizer circuit that will provide a flat 5-decibel gain must be added to the output of the R-417(*)/TRC.

b. C-41 Receiver. When the receiver of the C-41 is used with Transmitter, Radio T-302(*)/TRC in a four-channel carrier system, the modification listed in (1) below is required. When the receiver of the C-41 is used with the T-302(*)/TRC in a 12-channel

carrier system, the modifications in (1) and (2) below are required.

(1) Special crystals corresponding to the RF channel frequencies of the T-302(*)/TRC must be installed in the receiver of the C-41.

(2) The preemphasis network in the T-302(*)/TRC must be removed.

71. Radio Set Group AN/TRA-25 (F-Band)

(fig. 10)

The AN/TRA-25 is used to extend the frequency range of the AN/TRC-24, AN/TRC-35, AN/TRC-36, AN/GRC-78, AN/GRC-79, and AN/GRC-80. Information concerning the AN/TRA-25 is provided in paragraphs 4*a*, *b*, *c*, *d*, and *i*; 5*b*(11) and *c*; 16; 20; 28; 32; 39; 46; and 54 *a*, *b*, and *c*. The quantity of AN/TRA-25's required for each of the above equipments is provided in the chart below.

Equipment	Quantity of AN/TRA-25's required
AN/TRC-24.....	1
AN/TRC-35.....	2
AN/TRC-36.....	3
AN/GRC-78.....	1
AN/GRC-79.....	2
AN/GRC-80.....	3

DEMOLITION TO PREVENT ENEMY USE

72. Authority for Demolition

Demolition of the equipment will be accomplished only upon the order of the commander. The destruction procedures outlined in paragraph 73 will be used to prevent further use of the equipment.

73. Methods of Destruction

a. If complete destruction of the equipment cannot be accomplished in the time available, destroy the following components in the order given.

- (1) Transmitter, Radio T-302(*)/TRC.
- (2) Receiver, Radio T-417(*)/TRC.
- (3) Gasoline Engine Generator Set PU-286/G.
- (4) Transmitter and receiver tuning heads.
- (5) Antennas.
- (6) Miscellaneous equipment.

(b) Use any of the following methods to destroy the equipment.

- (1) *Smash.* Smash the controls, tubes, coils, switches, capacitors, and meters; use

sledges, axes, handaxes, pickaxes, hammers, or crowbars.

- (2) *Cut.* Cut the power cords and transmission cables; use axes, handaxes, or machetes.
- (3) *Burn.* Burn power cords, transmission cables, and technical manuals; use gasoline, kerosene, oil, flamethrowers, or incendiary grenades.
- (4) *Bend.* Bend panels, cases, and cabinets.
- (5) *Explode.* If explosives are necessary, use firearms, grenades, or TNT.

Warning: Be extremely careful with explosives and incendiary devices. Use these items only when the need is urgent.

- (6) *Dispose.* Bury or scatter the destroyed parts in slit trenches, foxholes, or throw them into streams.

APPENDIX I

REFERENCES

The following references are applicable for the operator of the radio set, the radio terminal set, the radio relay set, or the radio repeater set:

AR 700-38	Unsatisfactory Equipment Report (Reports Control Symbol SCGLD-247 (R2)).	TM 11-5073	Telephone Repeater AN/TCC-11 and Telephone Test Set TS-712/TCC-11.
AR 700-58	Report of Damaged or Improper Shipment (Reports Control Symbol CSGLD-66 (Army), BuSandA 4600-6 (Navy), Reports Control Symbol 4600-3 (Marine Corps), Air Force Exempt under par. 7c(3), AFR 174-1).	TM 11-5820-203-15	Towers AB-216/U and AB-216A/U, Tower Section Set AB-298/U, Guy Kit MK-101/U, Accessory Kit MK-100/U and Guy Kit MK 101/U.
DA Pam 108-1	Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings.	TM 11-5820-204-15	Operation and Organizational Field and Depot Maintenance, Radio Repeater Set AM/MRC-54(V).
DA Pam 310-series	Military Publications Indexes (as applicable).	TM 11-5820-263-12P	Operator, Organizational Field and Depot Maintenance Manual, Radio Terminal Set AN/MRC-69(V).
FM 21-5	Military Training.		Operator's and Organizational Maintenance Repair Parts and Special Tools Lists and Maintenance Allocation Chart for Radio Set Group OA-1387/GRC.
FM 21-6	Techniques of Military Instruction.		
FM 21-30	Military Symbols.	TM 11-5820-278-12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Amplifier Group OA-1390/GRC.
SR 320-5	Dictionary of United States Army Terms.		
SR 320-50	Authorized Abbreviations and Brevity Codes.	TM 11-5820-279-12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Amplifier GROUP OA-1392/GRC.
TB SIG 299	Wattmeter ME-82/U.		
TM 11-486-6	Electrical Communications Systems Engineering, Radio.	TM 11-5820-282-12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Amplifier Group OA-1394/GRC.
TM 11-679	Fundamentals of Carrier and Repeater.		
TM 11-940A	Gasoline Engine Generator Sets PU-286/G and PU-286A/G.		
TM 11-2142	Telephone Terminal AN/TCC-3 and Telephone Terminal AN/TCC-23		
TM 11-2150	Telephone Carrier Systems Using Telephone Terminal AN/TCC-7, Telephone Repeater AN/TCC-8 (AN/TCC-21).		

TM 5820-287-20	Organizational Maintenance, Radio Sets AN/TRC-24, AN/GRC-75, AN/GRC-78, and AN/GRC-81, Radio Terminal Sets AN/TRC-35, AN/GRC-76, AN/GRC-79, and AN/GRC-82, Radio Relay Set AN/TRC-36, Radio Repeater Sets AN/GRC-77, AN/GRC-80, and AN/GRC-83 and Radio Set Group AN/TRA-25.	TM 11-5820-309-12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Amplifier Group OA-1396/GRC.
TM 11-5820-293-12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Antenna-Filter Group OA-1397/GRC.	TM 11-5820-310-12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Antenna Filter Group OA-1395/GRC.
TM 11-5820-296-12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Antenna Group OA 1398/GRC.	TM 11-5820-311-12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Antenna-Filter Group OA-1391/GRC.
TM 11-5820-301-12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Generator Set Group OA-1675/GRC.	TM 11-5820-312-12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Antenna Filter Group OA-1393/GRC.
TM 11-5820-302-12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Antenna Group OA-1389/GRC.	TM 11-5820-457-12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Radio Set Group AN/TRA-25.
TM 11-5820-303-12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Power Accessories Group OA-1676/GRC.	TM 11-5930-201-15P	Operator's, Organizational, Field and Depot Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart, Switch Box SA-331/U.
		TM 11-6115-202-10P	Basic Issue Items List Generator Set, Gasoline Engine PU-286/G; and Power Unit PE-197 (PU-286/G).

APPENDIX II

BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

1. Scope

a. This appendix lists items supplied for initial operation and for running spares. The list includes tools, accessories, parts, and material issued as *part of* the major end item. The list includes all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

b. The columns are as follows:

- (1) *Source, maintenance, and recoverability code.* Not used.
- (2) *Federal stock number.* This column lists the 11-digit Federal stock number.
- (3) *Designation by model.* Not used.
- (4) *Description.* Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description on the requisition.
- (5) *Unit of issue.* The unit of issue is the supply term by which the individual item

is counted for procurement, storage, requisitioning, allowances, and issue purposes.

- (6) *Expendability.* Expendable items are indicated by the letter X; nonexpendable items are indicated by NX.

- (7) *Quantity authorized.* Under "Items Comprising an Operable Equipment" the column lists the quantity of items supplied for the initial operation of the equipment. Under "Running Spares and Accessory Items" the quantities listed are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

- (8) *Illustration.*

- (a) *Figure No.* The "Figure No." column list the figure No. that illustrates the equipment.

- (b) *Item No.* Not used.

2. References

See appendix I.

SECTION II FUNCTIONAL PARTS LIST

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS FIGURE NO	(9) ITEM NO
			ITEMS COMPRISING AN OPERABLE EQUIPMENT					
			RADIO SET AN/TRC-24; RADIO TERMINAL SET AN/TRC-35; RADIO RELAY SET AN/TRC-36; RADIO SET AN/GRC-75; RADIO TERMINAL SET AN/GRC-76; RADIO REPEATER SET AN/GRC-77; RADIO SET AN/GRC-78; RADIO TERMINAL SET AN/GRC-79; RADIO REPEATER SET AN/GRC-80; RADIO SET AN/GRC-81; RADIO TERMINAL SET AN/GRC-82; RADIO REPEATER SET AN/GRC-83					
			AN/TRC-24					
	5820-503-1133		RADIO SET AN/TRC-24:	ea	NX			
	Ord thru AGC		TECHNICAL MANUAL TM 11-5820-287-	ea	X	2		
	5820-543-0111		ANTENNA-FILTER GROUP OA-1393/GRC	ea	NX	1	7	
	5820-543-0109		ANTENNA-FILTER GROUP OA-1395/GRC	ea	NX	1	9	
	5820-543-0112		AMPLIFIER GROUP OA-1392/GRC	ea	NX	1	6	
	5820-543-0110		AMPLIFIER GROUP OA-1394/GRC	ea	NX	1	8	
	5820-566-7945		ANTENNA ACCESSORIES GROUP OA-1398/GRC	ea	NX	1	5	
	5820-543-0115		ANTENNA GROUP OA-1389/GRC	ea	NX	1	4	
	5820-543-1282		GENERATOR SET GROUP OA-1675/GRC	ea	NX	1	3	
	5820-543-1283		POWER ACCESSORIES GROUP OA-1676/GRC	ea	NX	1	2	
	5820-543-0116		RADIO SET GROUP OA-1387/GRC	ea	NX	1	1	
			AN/TRC-35					
	5820-503-2578		RADIO TERMINAL SET AN/TRC-35	ea	NX			
	Ord thru AGC		TECHNICAL MANUAL TM 11-5820-287-	ea	X	2		
	5820-543-0112		AMPLIFIER GROUP OA-1392/GRC	ea	NX	1	6	
	5820-543-0110		AMPLIFIER GROUP OA-1394/GRC	ea	NX	1	8	
	5820-566-7945		ANTENNA ACCESSORIES GROUP OA-1398/GRC	ea	NX	1	5	
	5820-543-0111		ANTENNA-FILTER GROUP OA-1393/GRC	ea	NX	1	7	
	5820-543-0109		ANTENNA-FILTER GROUP OA-1395/GRC	ea	NX	1	9	
	5820-543-0115		ANTENNA GROUP OA-1389/GRC	ea	NX	1	4	
	5820-543-1282		GENERATOR SET GROUP OA-1675/GRC	ea	NX	1	3	

AN/TRC-24,35,36; AN/GRC-75 thru 83

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS	
							FIGURE NO	ITEM NO
			AN/TRC-24,35,36; AN/GRC-75 thru 83 (continued)					
	5820-543-1283		POWER ACCESSORIES GROUP OA-1676/GRC	ea	NX	1	2	
	5820-543-0116		RADIO SET GROUP OA-1387/GRC	ea	NX	1	1	
			AN/TRC-36					
	5820-569-0031		RADIO RELAY SET AN/TRC-36	ea	NX			
	Ord thru AGC		TECHNICAL MANUAL TM 11-5820-287-1	ea	X	2		
	5820-566-7945		ANTENNA ACCESSORIES GROUP OA-1398/GRC	ea	NX	1	5	
	5820-543-0112		AMPLIFIER GROUP OA-1392/GRC	ea	NX	2	6	
	5820-543-0110		AMPLIFIER GROUP OA-1394/GRC	ea	NX	2	8	
	5820-543-0111		ANTENNA-FILTER GROUP OA-1393/GRC	ea	NX	1	7	
	5820-543-0109		ANTENNA-FILTER GROUP OA-1395/GRC	ea	NX	1	9	
	5820-543-0115		ANTENNA GROUP OA-1389/GRC	ea	NX	1	4	
	5820-543-1282		GENERATOR SET GROUP OA-1675/GRC	ea	NX	1	3	
	5820-543-1283		POWER ACCESSORIES GROUP OA-1676/GRC	ea	NX	1	2	
	5820-543-0116		RADIO SET GROUP OA-1387/GRC	ea	NX	2	1	
			AN/GRC-75					
	5820-581-2104		RADIO SET AN/GRC-75	ea	NX			
	5820-566-7945		ANTENNA ACCESSORIES GROUP OA-1398/GRC	ea	NX	1	5	
	5820-543-0113		ANTENNA-FILTER GROUP OA-1391/GRC	ea	NX	1	12	
	5820-543-0114		AMPLIFIER GROUP OA-1390/GRC	ea	NX	1	11	
	5820-543-1282		GENERATOR SET GROUP OA-1675/GRC	ea	NX	1	3	
	5820-543-1283		POWER ACCESSORIES GROUP OA-1676/GRC	ea	NX	1	2	
	5820-543-0116		RADIO SET GROUP OA-1387/GRC	ea	NX	1	1	
			AN/GRC-76					
	5820-557-6260		RADIO TERMINAL SET AN/GRC-76	ea	NX			
	5820-566-7945		ANTENNA ACCESSORIES GROUP OA-1398/GRC	ea	NX	1	5	
	5820-543-0113		ANTENNA-FILTER GROUP OA-1391/GRC	ea	NX	1	12	
	5820-543-0114		AMPLIFIER GROUP OA-1390/GRC	ea	NX	1	11	
	5820-543-1282		GENERATOR SET GROUP OA-1675/GRC	ea	NX	1	3	
	5820-543-1283		POWER ACCESSORIES GROUP OA-1676/GRC	ea	NX	1	2	
	5820-543-0116		RADIO SET GROUP OA-1387/GRC	ea	NX	1	1	
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(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS FIGURE NO.	(9) ITEM NO.
	5820-543-0116		AN/TRC-24,35,36; AN/GRC-75 thru 83 (continued) RADIO SET GROUP OA-1387/GRC	ea	NX	1	1	
			AN/GRC-77					
	5820-557-6259		RADIO REPEATER SET AN/GRC-77	ea	NX			
	5820-566-7945		ANTENNA ACCESSORIES GROUP OA-1398/GRC	ea	NX	1	5	
	5820-543-0113		ANTENNA-FILTER GROUP OA-1391/GRC	ea	NX	1	12	
	5820-543-0114		AMPLIFIER GROUP OA-1390/GRC	ea	NX	2	11	
	5820-543-1282		GENERATOR SET GROUP OA-1675/GRC	ea	NX	1	3	
	5820-543-1283		POWER ACCESSORIES GROUP OA-1676/GRC	ea	NX	1	2	
	5820-543-0116		RADIO SET GROUP OA-1387/GRC	ea	NX	2	1	
			AN/GRC-78					
	5820-581-2103		RADIO SET AN/GRC-78	ea	NX			
	5820-543-0112		AMPLIFIER GROUP OA-1392/GRC	ea	NX	1	6	
	5820-543-0108		AMPLIFIER GROUP OA-1396/GRC	ea	NX	1	13	
	5820-566-7945		ANTENNA ACCESSORIES GROUP OA-1398/GRC	ea	NX	1	5	
	5820-543-0111		ANTENNA-FILTER GROUP OA-1393/GRC	ea	NX	1	7	
	5820-543-0107		ANTENNA-FILTER GROUP OA-1397/GRC	ea	NX	1	14	
	5820-543-0115		ANTENNA GROUP OA-1389/GRC	ea	NX	1	4	
	5820-543-1282		GENERATOR SET GROUP OA-1675/GRC	ea	NX	1	3	
	5820-543-1283		POWER ACCESSORIES GROUP OA-1676/GRC	ea	NX	1	2	
	5820-543-0116		RADIO SET GROUP OA-1387/GRC	ea	NX	1	1	
			AN/GRC-79					
	5820-693-9796		RADIO TERMINAL SET AN/GRC-79:	ea	NX			
	5820-543-0112		AMPLIFIER GROUP OA-1392/GRC	ea	NX	1	6	
	5820-543-0108		AMPLIFIER GROUP OA-1396/GRC	ea	NX	1	13	
	5820-566-7945		ANTENNA ACCESSORIES GROUP OA-1398/GRC	ea	NX	1	5	
	5820-543-0111		ANTENNA-FILTER GROUP OA-1393/GRC	ea	NX	1	7	
	5820-543-0107		ANTENNA-FILTER GROUP OA-1397/GRC	ea	NX	1	14	
	5820-543-0115		ANTENNA GROUP OA-1389/GRC	ea	NX	1	4	
	5820-543-1282		GENERATOR SET GROUP OA-1675/GRC	ea	NX	1	3	

AN/TRC-24, 35, 36; AN/GRC-75 thru 83

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
SOURCE MAINTENANCE, AND RECOVERABILITY CODE	FEDERAL STOCK NUMBER	DESIGNATION BY MODEL	DESCRIPTION	UNIT OF ISSUE	EXPENDABILITY	QUANTITY AUTHORIZED	ILLUSTRATIONS	
							FIGURE NO.	ITEM NO.
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	5820-543-1283		POWER ACCESSORIES GROUP OA-1676/GRC	ea	NX	1	2	
	5820-543-0116		RADIO SET GROUP OA-1387/GRC	ea	NX	1	1	
			AN/GRC-80					
	5820-561-6630		RADIO REPEATER SET AN/GRC-80	ea	NX			
	5820-543-0112		AMPLIFIER GROUP OA-1392/GRC	ea	NX	2	6	
	5820-543-0108		AMPLIFIER GROUP OA-1396/GRC	ea	NX	2	13	
	5820-566-7945	*	ANTENNA ACCESSORIES GROUP OA-1398/GRC	ea	NX	1	5	
	5820-543-0111		ANTENNA-FILTER GROUP OA-1393/GRC	ea	NX	1	7	
	5820-543-0107		ANTENNA-FILTER GROUP OA-1397/GRC	ea	NX	1	14	
	5820-543-0115		ANTENNA GROUP OA-1389/GRC	ea	NX	1	4	
	5820-543-1282		GENERATOR SET GROUP OA-1675/GRC	ea	NX	1	3	
	5820-543-1283		POWER ACCESSORIES GROUP OA-1676/GRC	ea	NX	1	2	
	5820-543-0116		RADIO SET GROUP OA-1387/GRC	ea	NX	2	1	
			AN/GRC-81					
	5820-578-5451		RADIO SET AN/GRC-81	ea	NX			
	5820-543-0110		AMPLIFIER GROUP OA-1394/GRC	ea	NX	1	8	
	5820-566-7945		ANTENNA ACCESSORIES GROUP OA-1398/GRC	ea	NX	1	5	
	5820-543-0109		ANTENNA-FILTER GROUP OA-1395/GRC	ea	NX	1	9	
	5820-543-0115		ANTENNA GROUP OA-1389/GRC	ea	NX	1	4	
	5820-543-1282		GENERATOR SET GROUP OA-1675/GRC	ea	NX	1	3	
	5820-543-1283		POWER ACCESSORIES GROUP OA-1676/GRC	ea	NX	1	2	
	5820-543-0116		RADIO SET GROUP OA-1387/GRC	ea	NX	1	1	
			AN/GRC-82					
	5820-578-5413		RADIO TERMINAL SET AN/GRC-82:	ea	NX			
	5820-566-7945		ANTENNA ACCESSORIES GROUP OA-1398/GRC	ea	NX	1	5	
	5820-543-0115		ANTENNA GROUP OA-1389/GRC	ea	NX	1	4	
	5820-543-0109		ANTENNA-FILTER GROUP OA-1395/GRC	ea	NX	1	9	
	5820-543-0110		AMPLIFIER GROUP OA-1394/GRC	ea	NX	1	8	
	5820-543-1282		GENERATOR SET GROUP OA-1675/GRC	ea	NX	1	3	
	5820-543-1283		POWER ACCESSORIES GROUP OA-1676/GRC	ea	NX	1	2	

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(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS FIGURE NO	(9) ITEM NO
	5820-543-0116		AN/TRC-24, 35, 36; AN/GRC-75 thru 83 (continued) RADIO SET GROUP OA-1387/GRC	ea	NX	1	1	
			AN/GRC-83					
	5820-578-5452		RADIO REPEATER SET AN/GRC-83	ea	NX			
	5820-566-7945		ANTENNA ACCESSORIES GROUP OA-1398/GRC	ea	NX	1	5	
	5820-543-0115		ANTENNA GROUP OA-1389/GRC	ea	NX	1	4	
	5820-543-0109		ANTENNA-FILTER GROUP OA-1395/GRC	ea	NX	1	9	
	5820-543-0110		AMPLIFIER GROUP OA-1394/GRC	ea	NX	2	8	
	5820-543-1282		GENERATOR SET GROUP OA-1675/GRC	ea	NX	1	3	
	5820-543-1283		POWER ACCESSORIES GROUP OA-1676/GRC	ea	NX	1	2	
	5820-543-0116		RADIO SET GROUP OA-1387/GRC	ea	NX	1	1	
			AN/TRA-25					
	5820-776-5406		RADIO SET GROUP AN/TRA-25	ea	NX	1	10	
			RUNNING SPARES AND ACCESSORY ITEMS					
			RADIO SETS AN/TRC-24, AN/GRC-75, AN/GRC-78, AN/GRC-81 RADIO REPEATER SET AN/GRC-80					
			NO PARTS AUTHORIZED FOR STOCKAGE AT FIRST ECHELON					
			AN/TRC-35					
	5820-543-0112		AMPLIFIER GROUP OA-1392/GRC	ea	NX	1	6	
	5820-543-0110		AMPLIFIER GROUP OA-1394/GRC	ea	NX	1	8	
	5820-543-0116		RADIO SET GROUP OA-1387/GRC	ea	NX	1	1	
			AN/TRC-36					
	5820-566-7945		ANTENNA ACCESSORIES GROUP OA-1398/GRC	ea	NX	1	5	
	5820-543-0112		AMPLIFIER GROUP OA-1392/GRC	ea	NX	1	6	
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(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS FIGURE NO	(9) ITEM NO
			AN/TRC-24, 35, 36; AN/GRC-75 thru 83 (continued)					
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	5820-543-0111		ANTENNA-FILTER GROUP OA-1393/GRC	ea	NX	1	7	
	5820-543-0109		ANTENNA-FILTER GROUP OA-1395/GRC	ea	NX	1	9	
	5820-543-0115		ANTENNA GROUP OA-1389/GRC	ea	NX	1	4	
	5820-543-0116		RADIO SET GROUP OA-1387/GRC	ea	NX	1	1	
			AN/GRC-76					
	5820-566-7945		ANTENNA ACCESSORIES GROUP OA-1398/GRC	ea	NX	1	5	
	5820-543-0114		AMPLIFIER GROUP OA-1390/GRC	ea	NX	1	11	
	5820-543-0116		RADIO SET GROUP OA-1387/GRC	ea	NX	1	1	
			AN/GRC-77					
	5820-566-7945		ANTENNA ACCESSORIES GROUP OA-1398/GRC	ea	NX	1	5	
	5820-543-0113		ANTENNA-FILTER GROUP OA-1391/GRC	ea	NX	1	12	
	5820-543-0114		AMPLIFIER GROUP OA-1390/GRC	ea	NX	1	11	
	5820-543-0116		RADIO SET GROUP OA-1387/GRC	ea	NX	1	1	

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For explanation of abbreviations used, see AR-320-50.

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